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ABSTRACT

The purpose of this report was to evaluate the more common small group methods in terms of their effectiveness in teaching adults. A rationale for small group instruction was presented, followed by descriptions of the principal methods, and an assessment based on existing research findings. It was concluded that small group methods can be effective for enhancing motivation for learning, developing positive attitudes toward later use of course materials, and improving problem solving skills. However, they were no more effective than lectures for transmitting information and concepts, although (when used in conjunction with lectures) the methods are helpful in increasing depth of understanding of the course content. Implications for use of small group methods, including requirements for instructors, were also discussed. (The document includes 82 references.) (Author/LY)

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Technical Report 70-3

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Theory and State of the Art of Small-Group Methods of Instruction

by

Joseph A. Olmstead

HumRRO Division No. 4

March 1970

Prepared for:

Office, Chief of
Research and Development
Department of the Army

Contract DAHC 19-70-C-0012

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HumRRO

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HumRRO Division No. 4
Fort Benning, Georgia
HUMAN RESOURCES RESEARCH ORGANIZATION

Technical Report 70-3
Work Unit INGROUP

The Human Resources Research Organization (HumRRO) is a nonprofit corporation established in 1969 to conduct research in the field of training and education. It is a continuation of The George Washington University Human Resources Research Office. HumRRO's general purpose is to improve human performance, particularly in organizational settings, through behavioral and social science research, development, and consultation. HumRRO's mission in work performed under contract with the Department of the Army is to conduct research in the fields of training, motivation, and leadership.

The findings in this report are not to be construed as an official Department of the Army position, unless so designated by other authorized documents.

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FOREWORD

This report is intended to present a general analysis of the present "state of the art" of small-group methods of instruction. Its purpose is to provide understanding of some of the more commonly used small-group techniques and of the rationale underlying them, as well as to evaluate their potential use as instructional methods. A handbook containing explicit guidelines for use of the methods is planned to be a later outcome of the research of which this report is the first product.

The research activities were carried out as part of Work Unit INGROUP by HumRRO Division No. 4 at Fort Benning, Georgia. The research was performed and most of the report preparation completed while HumRRO was part of The George Washington University. Dr. T.O. Jacobs is Director of the Division and Dr. J.A. Olmstead is INGROUP Work Unit Leader. Military liaison and support was provided by the U.S. Army Infantry Human Research Unit of which LTC Chester I. Christie, Jr. is Chief.

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Meredith P. Crawford
President
Human Resources Research Organization

SUMMARY AND CONCLUSIONS

MILITARY PROBLEM

The necessity for maintaining or improving the quality of instruction, despite the large number of students who must be educated or trained, is a difficulty continually faced by the Armed Forces. Accordingly, military trainers continue to search for ways of providing high-quality instruction while attempting to minimize the limitations normally inherent in mass programs.

One technique which has been proposed for overcoming some of the objections to mass programs is the use of small groups and of certain instructional methods suitable only for small groups. Although small classes, where feasible, have long been used in military training, the use of methods uniquely suited for small-group instruction has not been widespread. However, such methods have strong advocates in civilian educational circles, particularly among industrial trainers and teachers in the field of Adult Education. In view of the merits claimed for small-group methods by many educators, determination of their potential for use in military instruction becomes important.

RESEARCH PROBLEM

The purpose of this report is to provide an analysis of both the rationale and the present "state of the art" of small-group instruction. Accomplishment of this general purpose involved achieving several more specific objectives. One objective was to examine the theoretical foundations of small-group instruction, as found in group psychology and instructional theory, and determine the validity of identified concepts for application to problems of practical instruction. Another objective was to describe the more common small-group methods and evaluate each according to its advantages, disadvantages, possible uses, and potential outcomes. A final objective was to review research concerned with small-group instruction in order to determine the effectiveness of the technique for teaching adults.

APPROACH

The report is based upon both a survey of the literature and HumRRO experience in the use of small-group methods. Literature which was reviewed included all relevant publications cited in *Psychological Abstracts* from 1945-1968, applicable military and other governmental publications, and a large number of books and general publications in the fields of psychology, education, and industrial training. The literature review followed the research objectives stated above and included theories of group psychology and learning, methods of small-group instruction, and research on the instructional effectiveness of such methods.

For this report, the term "small group" refers to a collectivity of not more than 20 individuals. Further, the report is limited to consideration of learning within groups of adults—to include college students. The extensive literature concerned with teaching groups of children was not covered.

PRINCIPAL FINDINGS

The chapters of the report present an integrated rationale for small-group instruction, descriptions of the principal methods, and evaluations of the techniques based on existing research findings. Implications for the use of small-group methods are also discussed.

Small-group methods of instruction are based upon a rationale which is more elaborate than those for most other teaching methods. Central to the rationale is the use of social-psychological forces in small groups to enhance and optimize the conditions under which learning occurs. The rationale rests upon the premise that learning is partly a function of attitudes; education or training is a matter of overcoming resistance to change.

Conditions necessary to overcome attitudes that are resistant to change include (a) a learning climate that provides emotional support to students, (b) opportunity for them to practice an analytical attitude through controlled observation, (c) opportunity to experience varied and realistic learning situations, (d) opportunity for experimentation with new concepts, and (e) opportunity for the student to obtain feedback concerning others' reactions to his newly developed ideas.

These conditions can be provided best within the context of a small group which possesses (a) a common goal for learning, (b) a reasonable degree of cohesiveness, (c) norms conducive to learning, and (d) patterns of effective communication—in short, a learning culture. Small-group methods are designed to systematically use these group forces to influence and increase learning.

Although the various small-group methods rest upon a common rationale, they differ in terms of goals, requisite trainer skills, and expected student reactions. Accordingly, the methods summarized below must be viewed as instruments appropriate for specific purposes and specific conditions:

(1) The **Conference Method** involves a series of discussion sessions, each with a specific goal, in which the conference leader guides students in exploration of topics or problems relevant to the overall purpose of the instructional program. Conference leaders are not required to be subject-matter experts, and relatively inexperienced personnel can be trained to lead conferences. Learning is mainly cognitive, with heavy emphasis upon insight into practical problems gained through the exchange of viewpoints.

(2) The **Leaderless Discussion** is a discussion session in which an instructor does not participate and no formal leader is designated. The method is most commonly used to overcome the formalities inherent in large classes through subgrouping and spontaneous discussion in order to introduce issues or problems, generate involvement among students, and provide opportunity for the exchange of ideas.

(3) The **Case Method** consists of accounts of actual situations which are discussed with the objectives of discovering underlying principles and applying the principles to diagnose and solve the problems, in order to develop a problem-solving orientation among students. Variations of the Case Method include the Harvard Method, the Incident Process Method, and the Abbreviated Case.

(4) **Role Playing** provides a situation in which students assume roles of actual participants and enact the situation toward some resolution. Other students systematically observe behavior of the actors and, following the scene, report and discuss their observations. Role Playing emphasizes the analysis of actual behavior and, accordingly, is especially valuable for training in leadership and interpersonal relations within organizations.

(5) **Committee Problem Solving** involves the study of real or hypothetical problems by small groups of students who work together toward a final group product. The method is useful for developing effective group problem-solving techniques as well as for helping students to learn about problem content.

CONCLUSIONS

A review of existing research concerned with small-group methods leads to the conclusions that the techniques are effective for enhancing motivation to learn, developing positive attitudes toward later use of course material, and improving problem-solving skills. The methods are no more effective than lectures for transmitting information, concepts, and doctrine; however, when used in conjunction with lectures, they are helpful for increasing depth of understanding of course content.

It is also concluded that small-group methods can be used effectively by instructors who are not content experts; however, precise understanding of the rationale and procedures of the methods is essential. Furthermore, because the methods differ in terms of outcomes, requisite instructor skills, and reactions expected from students, clear and explicit instructional objectives are critical for effective use of the methods.

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Theory and State of the Art of Small-Group Methods of Instruction

Chapter 1

INTRODUCTION

THE PROBLEM

The quality of instruction provided to students is a continuing concern of educational institutions, of the Armed Forces, and of government. The problem has numerous aspects and many are currently being attacked by both researchers and practitioners. One difficulty which seems to be especially hard to overcome involves the necessity for maintaining or improving the quality of instruction despite increasingly large numbers of students who must be served.

Of necessity, mass educational endeavors usually serve only the "average" student. Therefore, both fast and slow learners may suffer the consequences of exposure to instruction that is not suited to their respective capabilities. Furthermore, the passive nature of the mass learning situation, the lack of close contact with instructors, and the impersonal atmosphere of large classes tend to stifle the motivation of many students. For these reasons, educators and trainers have continued to search for ways of providing high-quality instruction to increasingly large numbers of students.

Greater individualization of instruction has been proposed as one way of both taking into account and exploiting differences in students' abilities and in their motivation to learn. Probably the best-known methods for individualizing instruction are the several variants of programed instruction—teaching machines, programed books, and computer-assisted instruction. These methods are effective for numerous types of content and offer much promise when used with understanding of their benefits and limitations.

However, for numerous reasons total individualization is not always feasible or desirable. Accordingly, another technique proposed for overcoming some of the objections to mass programs is the use of small groups and of certain instructional methods suitable only for small groups. This technique has become increasingly popular in educational institutions, where it is claimed that small-group methods bring instructor and student closer together, are conducive to more intensive learning experiences, and greatly enhance the motivation of students.

APPROACH

The purpose of this report is to provide an analysis of both the rationale and the present "state of the art" of small-group instruction. Accomplishment of this purpose involved several more specific objectives: (a) to examine the theoretical foundations of small-group instruction, as found in group psychology and instructional theory, and to determine the validity of identified concepts for application to problems of instruction; (b) to describe the more common small-group methods and to evaluate each according to its advantages, disadvantages, and potential outcomes; (c) to review research concerned with small-group instruction in order to determine the effectiveness of the technique for teaching adults; (d) to draw implications for use of the methods in practical instruction.

The report is based upon a survey of the literature and HumRRO experience in the use of small-group methods. Literature which was reviewed included all relevant publications cited in *Psychological Abstracts* during the period 1945-1968, applicable military and other governmental publications, and a large number of books and general publications in the field of psychology, education, and industrial training. The literature review followed the research objectives and included theories of group psychology and learning, methods of small-group instruction, and research on the instructional effectiveness of such methods.

Each of the chapters which follow is devoted to one of the above objectives. In Chapter 2, the background and rationale for small-group instruction is discussed; Chapter 3 deals with the methods of small-group instruction, while evidence concerning advantages, disadvantages, and potential benefits from such instruction is evaluated in Chapter 4. Finally, implications for use of small-group methods is discussed in Chapter 5.

As a prologue, several caveats are appropriate. First, the focus is upon *small-group* instruction. For the purposes of this report, the term "small group" refers to a collectivity of not more than 20 individuals. This emphasis is necessary because of the distinction between "small-group instruction," as defined here, and so-called "discussion techniques" which may involve any number of individuals and are frequently used in civilian and military education under the rubrics of "class-centered instruction" and "conference" respectively. In this report, unless otherwise stated, the analysis will be limited to small groups.

Second, the concern of this report is with the effects of small-group methods upon individual learning. Much research has been devoted to comparing the products of joint problem-solving and learning efforts with those accomplished by individuals. Such studies have value for determining whether group products are better than those of individuals. However, since group problem solving and learning are not the concern of this report, the discussion will be limited to learning achieved by individuals within a small-group context.

Finally, the report will be limited to consideration of learning within groups of adults, to include college students. Although much of teacher training is devoted to the management of children's classes as groups, there is considerable evidence that adults respond to group influences differently than children. Accordingly, the material upon which this report is based did not include the extensive literature concerned with teaching children.

CRITICAL CONSIDERATIONS

Any worthwhile instructional program may require different activities, at different times, for different purposes. Therefore, *the importance of a method lies not in itself but in how well it accomplishes the purposes of the instructor.* This consideration is especially important for small-group methods. As will be shown in Chapter 4, small-group methods differ in terms of outcomes, requisite instructors' skills, and students' reactions. For these reasons, it will be productive to view the discussions which follow against a background of several critical considerations concerning the selection and evaluation of instructional methods. Although not always specified, these considerations are fundamental to the effective management of education and training.

TERMINAL PERFORMANCE OBJECTIVES

Probably the most important requisite for intelligent selection of a method is knowledge of the ultimate objectives of instruction (1, p. 14). Objectives should be explicitly understood in terms both of levels and kinds of learnings to be achieved by end of course and of kinds of behaviors to be exhibited after course completion.

ENABLING OBJECTIVES

A second consideration is the enabling objectives (1, p. 14)—those things the student must learn if he is to achieve the terminal objectives. Of particular relevance for small-group methods is the question of whether the goal is to teach along *content* or *methodological* lines (2, pp. 482-483). In the one case (content), instruction focuses on acquaintances with certain stimuli and, in the other (methodological), it is concerned with methods by which stimuli of value can be received. If information is introduced relative to the various types of military intelligence, this is content. On the other hand, the instructor who attempts to teach students *how* to interpret intelligence information is operating from a methodological orientation.

This issue is, of course, closely related to the matter of terminal performance objectives, which will usually dictate the proportion of content to methodology to be included in the course. For most courses, complete separation is virtually impossible; however, the distinction between content and methodological training is useful for evaluating instructional techniques.

DEGREE OF STUDENT INVOLVEMENT

Another way of viewing instructional methods is in terms of the amount of student involvement which they evoke. Involvement is related to motivation to learn, and the extent to which students become involved in the teaching-learning process may be a critical determinant of success. Instructional methods can be placed along a scale of involvement ranging from those which evoke only relatively passive participation to certain high-involvement techniques where students find it exceedingly difficult to remain uncommitted.

Although, in practice, the generation of involvement is mainly a problem in the mechanics for reaching training objectives, it is also closely related to questions about the nature of the learning processes necessary for changing behavior.

COGNITIVE LEARNING VERSUS EXPERIENCE

Much of the controversy over instructional methods boils down to a question of cognition versus experience. The question is whether cognitive learning alone is sufficient to result in changed behavior or whether experiencing alone will enable a student to perform effectively after completion of instruction. Will knowledge of appropriate or recommended actions equip a student to function adequately in real situations, or will experience in practice situations alone enable him to be successful? Currently, most opinion leans toward some balance between cognition and experience, with relative weights depending upon instructional objectives.

ABILITY AND EXPERIENCE OF STUDENTS

Some methods are productive only with more able students; others are especially designed for instructing inexperienced or less educated students. A related question involves the differences in ability among students within one learning group: Are all students of approximately the same level of ability, or is there wide variability among them?

CULTURAL BACKGROUND OF STUDENTS

Because of attitudes generated by their socio-economic and occupational cultures, people differ with respect to susceptibility to learning under varying conditions of formality. This is especially relevant for adults. Are students likely to be overly insecure if highly informal training methods are used, or will they feel stifled by excessive formality in the training situation?

STATUS AND AUTHORITY DIFFERENCES AMONG STUDENTS

Wide differences in status or authority among students in the same group can put strong inhibitions upon performance and learning. Differences in age, military rank, experience, level of expertise, and so forth may be especially inhibiting under the more informal methods of instruction.

NUMBER OF STUDENTS

Some methods are adaptable for large numbers of students; others are not. This problem is closely related to the number of instructors available and to the student-instructor ratio desired.

QUALIFICATIONS OF INSTRUCTORS

Degree of training, experience, and skill of instructors, both as teachers and as content experts, is an important factor in choice of method. Some of the most effective methods are usable only by highly skilled trainers; other only slightly less effective techniques may be used by instructors with a minimum of training.

TIME AVAILABLE FOR INSTRUCTION

The time that is available for instruction must be matched against the time required to reach a specific objective by a particular method. Some methods may require more time but produce better results than others.

Chapter 2

FOUNDATIONS OF SMALL-GROUP INSTRUCTION

BACKGROUND

The field of instructional methods is a morass of claims, counterclaims, and conceptual contradictions which impede attempts to build educational programs upon rational foundations. Small-group methods are no exception. The development of small-group instruction has been marked by both semantic confusion and a cultish fervor among its advocates which have frequently clouded the real issue of a scientific basis for its use. Nevertheless, it is possible to identify a more clearly articulated rationale for small-group instruction than for many other methods.

Scientists have long been aware of the effects which the presence of other people exerts upon the performance and thinking of an individual (3,4), and it has also been known for a long time that an individual's learning may be facilitated if he works in a group (5,6,7). However, systematic use of the small group as a medium for learning did not stem from the application of scientific knowledge, but from practical innovation in the field of adult education, where instructors found their more conventional techniques not altogether satisfactory for teaching mature students (8, p. 16).

Teachers of adults have found that many of their students exhibit strong resistance to instruction presented as dogma without opportunity for discussion and rebuttal. Furthermore, conventional techniques for motivating younger students do not seem to work as well with adults. In particular, grades, course credits, and degrees, the usual academic devices for rewarding and punishing, cannot be relied upon to motivate adults to the same extent as children. Compulsory attendance and reading assignments cannot always be enforced. On the other hand, educators have found that the greater knowledge and more mature outlook of most adults lead them to prefer an active role in learning. When the opportunity is provided for active, meaningful participation in the educational process, the motivation of most adults is very high, and many, in fact, become self-motivating.

Recognition of the value of active participation led many adult educators to resort to discussion as the primary vehicle for learning. Whereas, in conventional education, class discussion is used to support formal instruction by the teacher, adult educators conceived of discussion as the principal means by which learning is stimulated. They found that well-conducted discussions of relevant problems and issues satisfy the adult's need for active learning and, what is more, are better for overcoming resistance to new ideas than are more dogmatic methods based upon persuasion by an instructor.

From emphasis upon discussion, it was only a short step to the use of small groups. Discussion in large classes is difficult to stimulate and awkward to control. Moreover, it is not very conducive to intensive learning. Accordingly, adult educators turned more and more to discussion within small groups as the primary vehicle for learning.

It remained, however, for the scientific rationale to be provided from the field of "group dynamics" as fostered by Kurt Lewin (9) and some of his students. Concerned about many pressing social problems, Lewin evinced a strong bias toward research that would produce usable findings and much of his work reflected his interest in the application of scientific products to everyday affairs. His associates have extended the tradition until many workers in group dynamics are now deeply engaged in the practical application of group concepts within a variety of fields.

Much of applied group dynamics is concerned with effecting change of one kind or another (2, pp. 250-255). Since learning always involves change, education and training became early targets for the application of group dynamics concepts. From this point, it was only a short step to adult education, where small-group concepts were warmly received as scientific justification for practices which had already evolved through trial and error.

RATIONALE

Small-group techniques take many forms and the literature concerning them is equally varied. However, throughout this literature, there can be traced a number of common threads concerned with certain factors that affect learning and with conditions necessary for learning to occur. The discussion which follows is an attempt to weave into a single coherent formulation those related threads which, although appearing in a variety of sources, together form a reasonably integrated rationale for the use of small-group methods.

A FUNDAMENTAL CONCEPT

Fundamental to all small-group methods is the concept of *social interaction.* For practical purposes, "interaction" usually means discussion. Therefore, discussion is the process around which most, if not all, small-group methods have been developed. Although some methods may also involve students in other activities (role playing, games, etc.), discussion at some point is almost inevitably a critical part of the instructional procedure.

For educational purposes, "discussion" takes on a more precise meaning than those usually encountered in general usage. The critical distinction between social conversation or "bull sessions" and discussion, as used here, is in the purposes behind them. In discussion, there is a calculated and systematic attempt to apply knowledge, thought, and fact-finding to solution of a problem or resolution of an issue so that learning may occur. Accordingly, the kind of discussion around which small-group methods are built can be defined as *group deliberation, carried on through oral discourse, aiming at the cooperative solution of a problem or resolution of an issue through reflective thinking* (10, p.3). The various methods are merely different means by which conditions conducive to discussion can be created and by which they can be manipulated for learning purposes.

In the beginning, learning by discussion was rationalized on the assumption that the variety of viewpoints and opinions brought forth by students would result in cross-fertilization. However, after World War II, Lewin (9) and his associates (11, 12) provided new legitimacy based upon a more explicit rationale. When these scientists developed and tested the concepts of levels of behavior and resistance to change, with the accompanying method of unfreezing, changing levels, and refreezing through discussion and decision, they gave group discussion in education a more solid foundation. Where, previously, discussion had been viewed as leading only to cognitive reorientation through a kind of consensual validation, it was now seen as getting at something deeper.

THE NATURE OF PRACTICAL LEARNING

The current rationale begins with the premise that genuine learning involves a change in behavior (13). In short, if the student does not behave differently after the course than he did before, learning has not occurred. Following from such a pragmatic approach, the targets of education and training must be growth within the individual and change in his behavior. These are deeper and broader goals than the mere transmission of knowledge.

The acquisition of knowledge through solely cognitive processes is one important aspect of individual growth. However, knowledge that remains merely cognitive cannot much influence an individual's ability to function effectively (14). What is needed is a translation of knowledge so that it becomes genuinely significant in the experience of the learner.

Knowledge is important to the learner only as it contributes to modification of skills, attitudes, or the internal dynamics of the personality (15, pp. 66-67). According to this view, effective learning is insightful, meaningful learning, and isolated information and principles not tied to problems perceived by the learner as related to his life and needs contribute little to the insight process. Such information and principles are not really "understood." If retained at all, they are "pigeonholed" or converted to abstractions which possess no real significance for performance.

Learning which can be used is not a matter of filling a void with information. It is a process of reorganization of complex thought patterns, perceptions, assumptions, attitudes, feelings, and skills, and of relating these reorganized concepts to the external world and the problems faced in it. Thus, the learning process is effective only when something dynamic takes place within the learner (16, p.6).

Such learning must be active, participative, and involving. It is best accomplished through continuing experimentation, continual attempts to adjust concepts, and continued checking of one's ideas and interpretations against reality.

MOTIVATION TO LEARN

Most theories of instruction accept the premise that there must be a readiness for learning before it can occur. In practice, this means that the individual must perceive some need for change, must be capable of changing, and must perceive the learning situation as one which can facilitate such change in a direction acceptable to him. In short, learning cannot occur unless the individual is motivated and ready to learn.

Fundamental to the rationale for small-group instruction is the concept that the motivation to learn is a matter of attitudes and, what is more, that successful instruction requires not merely the stimulation of positive attitudes toward learning but, more important, the overcoming of attitudes that make the potential learner resistant to change (13, 14, 15, 17). Much of the methodology of small-group instruction is devoted to overcoming resistance to change.

Attitudes are generally organized and integrated around the person's image of himself, and they result in stabilized, characteristic ways of viewing the world, one's work, and other people (17). This stable way of viewing the world is comfortable for the individual and people sometimes go to great lengths to preserve stability even in the face of facts and information which appear to warrant a change in viewpoint. The suggestion of the need for change not only implies some criticism of the person, but also threatens the stability of his relationships with the world.

Such threats are especially common in learning situations. The need for learning implies the existence of a deficiency. The suggestion of a deficiency, or the need for change, is likely to be perceived as a threat to the individual's sense of identity and to his status position in relation to other people (17). Therefore, information too threatening for him to accept because it attacks his self-image is blocked out or interpreted in such a way as to pose less of a threat. The result is that learning does not really occur.

Furthermore, to learn raises images of potential discomfort or even failure. Learning new things means leaving the tried, sure and comfortable ways of thinking and behaving, unsatisfactory as they may be. It means setting out along unknown paths with the possibility of encountering unanticipated obstacles which may prove difficult or impossible to overcome. Accordingly, each person inevitably enters a potential change situation with at least some apprehension, either conscious or subconscious, and at most some severe anxiety.

Thus, both learning and the maintenance of change, once it has occurred, are assumed to have emotional as well as cognitive aspects (14). Stimulation of the motivation to change in thought and behavior and to maintain these changes is considered to be mainly a matter of overcoming both resistance within the student and forces in his environment that push against change. Much of small-group instructional methodology is devoted to creating conditions intended to minimize resistance and to stimulate motivation to learn.

CONDITIONS FOR LEARNING

Changes in behavior do not come easily, either for the student or for the instructor. On the other hand, instruction which is not genuinely intended to achieve change is a waste of time, effort, and money. Accordingly, the most critical problem facing every instructor is the creation of conditions under which change can occur.

Since learning is not solely an intellectual process, the rationale for small-group methods suggests that conditions under which instruction is to occur should take into account both cognitive and emotional aspects. If learning is to be achieved, resistance must be minimized, the student must be exposed to new ideas, and an active functioning frame of reference must be developed which will encompass both an awareness of the need to change and recognition of the real-life benefits to be derived from new ways of thinking and acting. Instructional methodology intended to accomplish these purposes must meet several requirements (14, 18).

A Climate for Learning

Probably the most important requirement is a supportive climate that reduces resistance to learning (14). The process of changing one's patterns of thought and behavior is difficult and a climate that reduces individual defensiveness and anxiety about exposure of inadequacy is paramount in overcoming resistance to learning.

The purpose is not to protect the student from exposure of inadequacies but, rather, to create a supportive atmosphere which will encourage him to undertake the task of learning, to cope with his anxieties and concerns, and to experiment with new ways of thinking and behaving. Development of a supportive atmosphere requires at least two essential conditions within the learning situation (14): First, threat must be minimized. The climate must be such that defensiveness is reduced and emotional support is provided while the learner is undergoing change in his thinking and action. Second, the learning situation must provide reinforcement for new ways of behaving. As the student tries out different ideas and skills, "correct" responses must be reinforced positively and "incorrect" responses must be reinforced negatively so that they will disappear.

Opportunity for Controlled Observation

Much that is presented in the conventional instructional setting never reaches a useful level of explicitness or clarity. For this reason, skill in applying knowledge received in conventional courses is extremely difficult to develop and usually takes years of on-the-job experience. However, the process can be speeded dramatically if opportunity is provided for students to experience situations where a range of thinking and of approaches to problems can be made open to observation and analysis (18).

Passively watching a demonstration or listening to a discussion of a problem is not enough. What is needed are calculated and purposive observations made under controlled conditions so that the learner becomes actively involved in developing and practicing an analytic attitude. Therefore, a second requirement is for learning situations in which conditions can be so controlled as to maximize practice in observation and analysis.

Opportunity to Experience Varied and Realistic Situations

As stated earlier, the rationale for small-group methods rests upon a conviction that the problem of instruction is not solely to transmit facts or viewpoints but to help the student to translate knowledge so that it becomes meaningful in his experience. According to this view, learning occurs when the entire person is involved, that is, when the individual is affected by the knowledge he acquires.

The extent to which a student becomes ego-involved in the learning process appears to be a major determinant of its effectiveness. Involvement is greatest when the learning situation can be structured so that students actively participate, rather than remaining passive. Although a student may be taught *about* self-insight and skills of living and working, these can become a part of his repertoire of behavior only through living through and learning from a stream of life events we call "experience." (19)

Although it is not always possible to create instructional situations identical to those encountered in the world of work, learners can become involved when problems or content are interesting, realistic, and relevant to the work in which the learning is to be applied. Accordingly, a third requirement for learning is opportunity for the student to actually experience himself functioning in situations which are as realistic and as relevant as possible (18).

The effective individual possesses the ability to identify the essential elements in a situation while stripping away and disregarding the many factors that are usually present but not relevant. However, in life, conditions are constantly changing and the effective person must be able to identify the unique characteristics of each situation he encounters. Skill in coping with unique situations is best developed when students are exposed to numerous problems which are sufficiently different to require a variety of responses. Accordingly, this requirement includes the opportunity for students to experience not only realistic and relevant situations but a variety of them as well.

Opportunity for Experimentation

Observing the performance of others does not, by itself, lead toward individual growth, even when good conditions for controlled observation in realistic and relevant situations are provided. Such observations help develop an analytical attitude, but they make no demands upon the student to examine his own ideas, nor do they enable him to see himself in action.

Learning new ways of thinking and acting is difficult. Improved learning usually comes in a series of small steps in which the learner tries out a variety of ideas, discarding those that are inappropriate and reinforcing those that are successful. This can occur only when there is freedom to make mistakes. Accordingly, a fourth requirement is the opportunity to experiment with new concepts and new ways of behaving under conditions where mistakes will not have serious consequences for the learner (18).

Opportunity for Objective Analysis of Own Performance

Although the opportunity to experience new situations is critical for learning, experience alone never benefits anyone. The important factor is the use the individual makes of his experience (19). Thus, while the opportunity to experiment is needed, it should be provided under conditions whereby the student can receive information about the effectiveness of new behaviors which he has tried.

Learning is best when students can consciously test their ideas in action, obtain knowledge of the results of the testing, and analyze this information in terms of consequences for future behavior in actual situations. Accordingly, a fifth requirement is opportunity for students to obtain feedback about the quality of their learned concepts and behaviors and to analyze their learning in terms of consequences for the future (18).

THE GROUP AS A SETTING FOR LEARNING

Considering the stressful aspects of learning and the requisite conditions outlined in the preceding section, it would seem that the most effective learning can be achieved in situations which provide emotional support to students while also enabling them to practice an analytic attitude, experiment with new concepts, and obtain feedback concerning others' reactions to their newly developed ideas. According to the rationale under consideration here, the above conditions can frequently be provided best within the context of a small group.

Much of education takes place in loosely structured group situations. For example, most formal instruction involves some sort of transaction between teacher, learner, and other students. Although learning is an individual affair, it most frequently occurs within a social context and much of the more complex learning can come about only through social interaction (20). Thus, group forces, either active or latent, are present in almost every educational situation, even though they may be untapped or uncontrolled. Small-group instructional methods are designed to systematically use these group forces to influence and increase the learning of individual students. The objective is to build and maintain groups geared to the purpose of learning and to use the forces inevitably present in such groups to create conditions that will be maximally conducive to learning.

Group Forces Affecting Learning

The social-psychological forces that operate in groups are many and varied. Of these, however, a number have been identified as operant in most situations and as particularly relevant to learning. In one form or another, these appear to provide the underlying bases for most small-group instructional methods.

Group Goals. A group goal is an objective that is held in common by all or most of the members. Since behavior is goal-directed, a group goal has the properties of concentrating the efforts of members and of mobilizing their efforts toward its achievement. Thus, under proper conditions, group goals have motivational properties that can exert considerable influence upon the behavior of members (21, p. 313).

Both research and experience have shown that a greater degree of learning occurs when students are psychologically involved and actively participate in activities in which learning is supposed to take place. Fullest involvement and participation occurs when students accept and become committed to goals of their instructional groups. A principal purpose of small-group methods is to develop instructional groups that possess the goals of increasing opportunities for individual learning.

Group Cohesiveness. The attractiveness of a group largely determines the degree of influence it can exert upon the individual member (22). If a group is attractive to all or most of its members, a feeling of "groupness" develops which is manifested in attitudes of loyalty and a willingness to be influenced. This group cohesiveness is a highly potent force which can, under proper conditions, be a major factor in learning.

One function served by cohesive groups is the establishment of a climate that supports readiness for learning. Such a climate includes the following (20):

(1) Expectations among members that everyone will learn.
(2) Acceptance that learning and change are desirable and not a mark of previous inadequacy.
(3) Recognition that individuals may make mistakes but, since all are learning, errors will not be punished by the group or other members.
(4) Realistic levels of aspiration for the group and for all members in terms of new learnings to be achieved.

Where such a climate exists, group influences can be strong in helping individuals develop a readiness to learn (overcome resistance) and then to change (23). For example, if the individual likes his group, it can exert pressure upon him to change as other members are changing. The fact that other members face the same difficulties is reassuring and, thus, there is less feeling of inadequacy. Moreover, such a group is able to offer potent rewards in the form of acceptance and recognition by other members. These rewards are usually more effective as motivators than those which can be offered by an instructor.

Group Norms. All groups with any degree of cohesiveness develop norms affecting the behaviors of their members. Norms are standards of behavior—shared expectations of what members should do, perhaps even what they should think and how they should feel. In time, these norms become stabilized and become powerful determinants of the behavior of group members (24). Thus, the development of an effective instructional situation is, in large part, dependent upon the evolution of certain norms which will be facilitative to optimal learning.

Norms may be concerned with just about anything related to the life of a group. Two of the more important ones for small-group instruction are norms which permit every member to experience difficulty and norms of objectivity in the analysis and solution of learning problems. These norms are essential ingredients of a climate conducive to learning and, accordingly, are major targets of small-group instructional methods.

The Communication System. In a basic sense, learning is a function of communication. This is true of all learning that occurs in educational or training contexts, especially in group instructional situations. The communications that occur within the group determine the amount and types of learning that will be achieved.

Communication within an instructional group may occur at various levels of depth (25). Much of the communication may be at the cognitive level, being primarily an exchange of ideas concerned with the topic under examination. However, many communications also carry noncognitive meanings. Thus, people communicate emotions, attitudes, and feelings, all of which may enter into and influence, either positively or negatively, the learning process.

If an instructional group matures and develops a capacity to work as a learning team, members communicate with one another easily and well. When members do not feel the need to defend themselves, and feel secure enough to expose their ideas to the group, the communication level becomes deep enough for genuine learning to occur. Small-group instructional methods are intended to provide conditions which will encourage communication that will be conducive to learning.

Functions Served by the Group

The rationale for small-group methods of instruction incorporates concepts of several kinds, including concepts about the nature of learning, factors that influence it, and ways in which it can be induced. However, underlying all of these is the fundamental premise that much of practical learning involves a social transaction, that is, it requires an interpersonal exchange between people.

On the face of it, this premise is not much different from those underlying conventional instruction. Both conventional techniques and small-group methods operate from the assumption that much of learning occurs as the result of interaction between people. The principal difference seems to be in the locus of the interaction and in the way learning results from it.

It would be foolish to claim that conventional instruction operates from any single set of integrated concepts which could be sharply contrasted with small-group methods. Too much of educational philosophy and practices is presently in a state of transition. Furthermore, many of the current debates are squarely grounded in conflicting notions about learning. Yet, through much of conventional education and training runs the concept of a fixed body of knowledge or doctrine and of naive learners who have not acquired the information or skills necessary to apply this knowledge in practical ways. According to this view, learning refers to the process by which learners acquire the information and skills from someone (an instructor) who is already in possession of them.

Small-group methods start with a different overall view of learning as a transaction between a learner and other learners, all of whom constitute a group. Under this concept, neither the learners nor the body of knowledge are fixed and both undergo modification during the transaction. In other terms, this means that much of learning to use knowledge in a practical way occurs through interaction between learners, during which concepts, practices, and additional knowledge from past experience can be exchanged, molded, integrated with information from instructors, and formed into a workable frame of reference which can later be applied to problems in the real world. Thus, in small-group instruction, the principal interaction is within the learning group and learning results from the exchange that occurs within the group.

Many of the concepts derived from learning theory apply equally in small-group instruction. Perhaps the most useful are the concepts of "reinforcement" and "feedback." With regard to reinforcement, one learns in groups as elsewhere—by responding to a stimulus. However, in the learning group, the stimulus is the behavior of other people. "Correct" responses are reinforced positively and tend to become established in the learner's repertoire of responses. "Incorrect" responses are negatively reinforced and tend to disappear. In the learning group, other members are the agents of positive and negative reinforcement.

A major difference appears, however, in the determination of which responses are "correct." In conventional instruction, the correctness of the response to be learned tends to be predetermined by instructor, doctrine, or a machine programer. This definition of correctness is held constant during the entire learning experience. On the other hand, in small-group instruction, group members function both as learners and as environment, and standards of appropriateness of stimulus and response are worked out through the "give-and-take" of an evolving discussion.

Closely related is the concept of "feedback." This concept is concerned with the powerful learning effects of prompt feedback to the learner about the effects of his exploratory responses. In all forms of learning, knowledge of the results of trial responses is deemed essential. This is no less true in small-group instruction. A principal aim is to provide conditions under which a learner may receive prompt feedback concerning the new ideas and skills which he is testing. In small-group instruction, this feedback is supplied either by other group members or by discussion leaders, depending upon conditions and the method used.

In small-group instruction, the group provides a stimulus environment, within which learning is both stimulated and tested. As a stimulus environment, the group serves three functions which differentiate small-group instruction from individual-centered education or training (26, pp. 52-54). The functions involve (a) resources, (b) social motivation, and (c) social influence.

Resources. One of the principal functions of the group is to serve as a resource to learners. The typical group will have a wider range of information and a greater critical facility than any individual member. Furthermore, the greater potential resources make the group more likely to discover a wider range of alternatives than a single member. The pooling of individual judgments also tends to eliminate erroneous or inappropriate concepts and conclusions. Because group discussion is selective, the final product will probably have eliminated many of the poorer alternatives generated by members. Thus, selectivity often improves the quality of learning.

It cannot be assumed that more information, greater critical facility, and opportunity to pool judgments will inevitably improve the quality of learning in groups. The existence of a group merely makes these resources available. However, unless they are used effectively, they may contribute little and, under some conditions, can actually impede learning because of the confusion which may be created among members.

Social Motivation. Because motivation is a critical determinant of learning and because factors that influence motivation are, in education and training, predominantly social, the motivational consequences of group interaction are difficult to overemphasize. The mere presence of other people in a learning situation creates new motivational implications because many of the goals and rewards valued by most individuals are available only from interaction with other people. These effects are further strengthened when an actual group is developed. Under these conditions, the forces that operate in all groups channel and focus individual motivation in directions determined by the collective goals.

Just as with the provision of resources, the existence of a group situation does not necessarily insure that motivational forces will be directed toward learning. A group can be a powerful source of social motivation; however, the nature and direction of that motivation will be determined by the goals of the group and the conditions that exist within it.

Social Influence. The social influence function of learning groups is concerned with the development and enforcement of norms governing the attitudes and behavior of group members. In small-group instruction, group influence is exerted through standards related to type and amount of participation, collaboration between members, depth of discussion, feedback to be provided members, levels of communication, support given discussion leaders, and similar factors. Although many factors may affect the ability of a group to influence its members, its potential for influencing a particular individual is determined, in large part, by the extent of his attraction to the group and of his desire to remain in the group and to be accepted by other members.

Again, the existence of a group is no assurance that its norms will be conducive to learning. Depending upon conditions, norms may develop around any issue that has relevance for a group and may exert influence in any direction. An important problem for instructors is to create conditions that will ensure the development of norms that are conducive to learning.

OVERVIEW

The concepts discussed in the preceding sections of this chapter form the foundation for small-group instructional methods. Central to the approach is the use of the social-psychological forces in small groups to enhance and maximize the conditions under which learning occurs.

In the final analysis, the responsibility for learning must rest with the individual student. Learning can occur only within the individual and he must be the final determinant of whether change will, in fact, take place. Thus, the old axiom which states that "if the learner hasn't learned, the teacher hasn't taught" can never be altogether true. But the fundamental responsibility of every instructor is to create around the student those conditions that will be most conducive to learning. This is, in effect, the role of the teacher.

Small-group methods of instruction are one approach to the creation of conditions conducive to learning. Regardless of the particular method used, the rationale for small-group instruction rests upon the premise that learning is partly a function of attitudes, and education or training is a matter of overcoming resistance to change. This can be accomplished by discussing issues or problems and, in many instances, arriving at decisions about how they might be handled. Because the group resolves the problem itself with each student participating, members are committed to the solution through the functioning of group norms endorsing the new ideas or behaviors. Under this rationale, two purposes are assumed to be accomplished: (a) students get new insights into problems by hearing many different viewpoints and by having their own ideas critiqued, and (b) they learn new ways of behaving to which they are committed because of group discussion and decision.

For maximum change to occur, a group must possess a common goal for learning, a reasonable degree of cohesiveness, norms conducive to learning, and patterns of effective communication—in short, a learning culture. In permanently structured groups, these ingredients may already be present. However, in most instructional situations, where students usually meet for short periods spread over weeks or months, instructors must create and develop the requisite structure and processes of the group. The various methods used in small-group instruction are merely devices for accomplishing these purposes.

Chapter 3

METHODS OF SMALL-GROUP INSTRUCTION

INTRODUCTION

In Chapter 2, the discussion centered around the common threads that underlie the various small-group techniques of instruction. The present chapter presents a description of the principal methods and an analysis of the types of learnings each appears to accomplish.

It was emphasized in Chapter 2 that, whether explicit or not, all of the techniques which fall under the rubric *small-group methods* rest upon a particular concept of learning and of the conditions necessary for learning to occur. It was also suggested that the various methods are merely different devices for using group processes to enhance learning. However, emphasis upon similarities should not be carried too far. Although all methods appear to rest upon a common foundation, some genuine differences do exist and it is important to be aware of those differences. Small-group methods differ in terms of goals, prerequisite trainers' skills, and expected student reactions. Accordingly, they should be viewed as instruments appropriate for specific purposes and under specific conditions.

In the discussion to follow, examination of each method will focus upon such aspects as the operations involved, learnings the method appears to accomplish, and ways it may be used. In considering these aspects, each of the methods is treated as relatively "pure," that is, as a distinctly different approach. The distinctions are not always so clear-cut in practice where methods are often combined, modified, or used in conjunction with other techniques. Such modifications are entirely permissible as long as the instructor is aware that effects may be changed accordingly. Nevertheless, for the purposes of this report, each method will be treated as a distinctive approach to education or training.

CONFERENCE METHOD

The conference technique is by far the most popular small-group method currently used in industrial training. Reasons for its popularity are not difficult to find. For one thing, the method does not require a subject-matter expert. Accordingly, it is possible to train an unsophisticated person in a reasonably short time so that he can do a creditable job as a conference leader. Another reason is that the method closely follows the rationale for small-group methods and, therefore, has achieved a measure of respectability which has made it the method of choice in many organizations.

The conference method involves a series of carefully planned meetings with specific goals, in which leader and students discuss topics or problems relevant to the over-all purpose of the instructional program. The method rests squarely upon group discussion but, in contrast with the Leaderless Discussion, is dependent upon the trainer's manipulation of the discussion process so that it is always directed toward specific program goals.

Usually the conference leader does not present theory, principles, doctrine, or ways of handling problems. Rather, the group is presented with a topic or problem and members speculate about possible ways of handling it. Solutions may be suggested by members and evaluated by the group through a free exchange of experiences and opinions. The group may evolve ideas which become the accepted solutions or the leader may guide the discussion along some particular course toward a predetermined solution of his own. Thus, in its purest form, the conference method is a highly practical approach to education or training. Students are not exposed to theory, principles, doctrine, or expertise. Rather, discussions and solutions are derived from their own experiences or ideas and are applied to real-life problems.

In this connection, it is important to distinguish between the "free" conference and the "directed" conference. The free conference involves a completely unguided discussion and is usually problem-centered. The agenda is developed by taking a problem-census in which participants suggest potential topics. Solutions are those freely evolved through discussion.

The directed conference is more frequently used for training purposes. Here, the conference leader uses a predetermined agenda and each topic on it is discussed. The discussion may be relatively free; more frequently, it is guided by the leader who makes sure certain points are covered. In some cases, the discussion is "directed" to the extent that the leader actually manipulates it to reach a predetermined conclusion.

The conference method has much to recommend it, especially with reference to training management. For example, relatively inexperienced personnel can be trained to lead conferences. Subject-matter experts are not necessary, although such specialists are certainly able to improve the quality of a program. Conference leaders' guides can be prepared by experts to provide complete instructions with regard to steering a discussion. If needed, a step-by-step outline can be developed to include all points to be covered, the actual words to use in opening and closing each session, conclusions to be reached, and similar materials. The method thus permits conduct of training with whatever personnel may be at hand. Furthermore, if the leader is skillful, he can control the discussion, thus insuring that "school solutions" are developed by the group.

On the other hand, if the leader is not a content expert, there is much greater risk of superficiality in the discussions. Because of lack of expertise among students, discussions tend to skirt issues unless the conference leader can skillfully probe relevant points and raise questions which will give students insight into underlying problems. In order to accomplish this well, the leader must be sufficiently knowledgeable in content areas to identify both superficial diagnoses and critical issues so that the group can be guided into more meaningful discussions.

Learning from the conference method appears to be mainly cognitive, with heavy emphasis upon insight into practical problems gained through the exchange of viewpoints. Although, as its adherents claim, the method possesses potential for changing attitudes, genuine change seems to depend more upon the competence and skill of individual conference leaders rather than upon the method itself. Because the method rests almost solely upon discussion, no opportunity is provided for skill practice. Thus, students get no experience with real behavior under either experimental or practice conditions. Some trainers attempt to overcome this limitation through the auxiliary use of role playing.

LEADERLESS DISCUSSION

The term "leaderless discussion" refers to a group discussion for which a formal leader has not been designated and in which an instructor does not participate. Instead, the influence of the instructor is limited to assignment of a topic, problem, or issue to be discussed. In this way, the content and course of the discussion are determined almost completely by the students. This technique, when used for training, is to be distinguished from the Leaderless Group Discussion described by Bass (27), which is used mainly for the assessment of leadership potential.

Most commonly, leaderless discussion is used in conjunction with large-group sessions to introduce issues, to generate involvement among participants, and to provide opportunity for the exchange of ideas. When used in this way, the leaderless discussion groups are, in effect, sub-groups of the larger classes. The usual procedure is for the instructor of a large class to divide it into small groups which are then required to discuss some topic, problem, or issue for a specified period of time. The discussion may occur either before a formal presentation (to introduce issues or generate involvement) or following it (to exchange ideas). In either case, the purpose is to generate more effective learning by overcoming the formalities inherent in large classes through subgrouping and spontaneous discussion.

TOPIC DISCUSSIONS

One type of leaderless discussion is the "topic discussion." In this form, the instructor assigns a specific topic or issue for discussion and allows a fairly lengthy period of time, such as 30 minutes or an hour, for completion. He may assign advance readings to prepare students for the discussion. The instructor may also provide students with a list of issues for discussion, guidance as to questions to be answered, and so forth. In all instances, however, responsibility for the nature and quality of the discussion rests with the students.

The topic discussion is useful for identifying issues or for introducing a problem to students. When students discuss a problem prior to a formal presentation such as a lecture or film, attention becomes focused upon critical issues and involvement with formally presented material is greater. Another use for topic discussions is to develop solutions to problems. Here, a limitation is that clear-cut solutions are sometimes difficult to obtain because of lack of the direction which could be provided by a discussion leader.

Learning achieved through topic discussions appears to be mainly in the form of increased sensitivity to issues and problems and, in better groups, perhaps a fairly superficial insight into solutions to specific problems.

BUZZ SESSIONS

A "buzz session" is a brief but intensive discussion held among a small number of participants without advance preparation and with a minimum of formality. In this procedure, a question or issue is posed to a class. Members are then asked to turn to one or several neighbors (or to form convenient groups) and to engage in discussion for several minutes.

Buzz sessions appear to be most useful for introducing issues and problems, and thus, laying groundwork for learning to be achieved from later formal presentations or guided class discussions. Some evidence exists that buzz sessions result in both improved problem solving and participation in class discussions (28). They do not appear to exert much effect upon attitudes.

CASE METHOD

In general, the case method involves the exposure of students to accounts of concrete situations with some temporal and developmental span in which a variety of factors are at work. The cases are descriptions—printed, tape-recorded, or filmed—of actual situations from real life and students discuss them with the objectives of discovering underlying principles, if any, and applying the principles to diagnosis and solution of the problems. Although case discussions may be held with large classes, much of the effectiveness of discussion is lost as size of class increases and the greatest learning seems to be achieved when discussion groups are small. For this reason, the case method is included in this analysis of small-group instructional methods.

Several approaches to the study of cases have been developed. In fact, some practitioners consider role playing and even sensitivity training to be derivations of the case method (29). However, for this report, the distinction will be retained. Here, discussion of the case method will be limited to the Harvard case study, the Incident-Process method, and abbreviated cases.

HARVARD METHOD

The case method of teaching originated in law schools where students learn by analysis of actual court cases. Later, the method was adopted by the Harvard Business School where much of the curriculum is now based upon a case approach. It is the Harvard orientation which governs most uses of the case method today. The approach rests upon a carefully disciplined rationale encompassing case preparation, discussion leading, and method of analysis (30).

Typically, a case is a printed record of a problem or issue which actually has been faced by someone, together with surrounding facts, opinions, and prejudices upon which decisions had to be made. The cases are presented to students for considered analysis, open discussion, and final decision as to the action which should be taken. Most frequently, cases are assigned in advance of the discussion so that students will have opportunity for careful analysis. The case is then discussed in class with the instructor serving as moderator. Students may also be required to submit written analyses.

In the Harvard method, a course is usually limited to case analysis and discussion. Occasionally, supplemental readings may be assigned. In the strictest practice of the Harvard method, no theory or principles are presented. However, some trainers have used lectures to provide a frame of reference for thinking about the problems posed by the cases.

Under the case method, the instructor's role is to assign the cases for discussion, to act as a responsible member of the group delegated to provoke argumentative thinking, and to guide discussion toward points of major importance by his own contributions and questions. He may, if he chooses, take a final position on the viewpoints which have been threshed out before him.

According to the Harvard method, it is a requirement that the instructor adopt a nondirective role, withholding his own opinions and attempting at all times to establish a permissive atmosphere within the group. He is concerned solely with the quality of student thinking and with stimulating deeper and more mature problem analysis. A basic premise is that the individual will learn and better remember those things which he discovers for himself. Accordingly, the function of the instructor is not to give answers but to help the student to develop his analytical ability.

Practitioners of the method contend that preparation of case material is extremely important. In order for proper analysis and discussion to occur, the case must contain appropriate background, facts, conflict, and sequence of events. One characteristic of case writing is strict adherence to a consistent point of view. The writer supplies only events and facts; feelings and thoughts of the characters are not reported. Furthermore, he looks not only at the active instrumental elements of the situation, such as procedures and techniques, but at the processes by which the action takes place—process in 'terms of interactions among people and the behaved or verbalized expressions of these people.

At this point, it is important to distinguish between a *teaching case* and a *case history*. A teaching case is a carefully designed description of a problem situation, written specifically for the purpose of provoking systematic analysis and discussion. As such, it does not necessarily represent a complete description of all facts and events. A skillful writer composes his case with the objective of creating a challenging problem. Furthermore—and most important—the outcome is never revealed; the case is brought to a point requiring decision and action, then it stops. In contrast, a case history usually involves the historical enumeration of all relevant aspects of a person, situation, or event, including the outcome. It is intended to illustrate some type of behavior, a phenomenon, how a problem was resolved, or other aspects. The fundamental distinction is that a teaching case is intended to pose a problem, while a case history illustrates something. Proponents of the case method would contend that a case history is a poor vehicle for training in problem analysis.

Thus, composition of the case is highly important and requires a certain degree of skill. If cases are not structured so as to challenge mature analysis and stimulate discussion, failure is likely (31). In this regard, it should be noted that cases can be written to highlight the problems indicated by the particular objectives of the course. For example, a case for a class dealing with leadership might emphasize the interpersonal aspects of a situation while a case intended for a class in technical administration could highlight the formal procedural aspects of the same situation. In addition, cases may cover any type of problem—human, administrative, or technical.

The Harvard method rests upon a two-pronged rationale concerned with (a) the knowledges and skills necessary to function effectively in real life, and (b) the best ways of teaching students requisite skills with which to do so. Under this approach, it is believed that, as far as responsible activity in the real world is concerned, a fund of ready-made answers can be of little avail (16). Each situation is a new situation, requiring imaginative understanding as a prelude to sound judgment and action. Usually an individual will not have all the facts and viewpoints, and thus there is no one best answer. Accordingly, what is most needed is the ability to take all available information, sift out relevant facts, see the relationships between them, and make sound judgments and decisions relative to them.

Corollary with this view is a position on the best way to equip students to solve real-life problems. This position attacks the assumption of traditional academic teaching that it is possible by a simple process of telling (lecture) to pass on knowledge in a useful form. No amount of information, whether of theory or of fact, in itself improves insight and judgment or increases ability to act wisely under conditions of responsibility (16). Advocates of the case method contend that students must be initiated into the ways of independent thought and responsible judgment by being confronted with "real" situations which must be analyzed and by submitting their analyses to the criticism of contemporaries. The case method attempts to put the burden of independent thinking upon students by forcing them to use their own knowledge and insight. This is accomplished by inculcating a fact-finding approach to problems which is expected to become a characteristic way of thinking.

Thus, the Harvard case method rests upon a carefully developed rationale. Since the logic of the approach is reasonable, it has attracted many advocates. However, for this report, an important question remains. What precisely can the case method be expected to accomplish?

The method appears to train students in the skills of conceptual diagnosis. Over a long period of exposure to case analysis, a student develops a fact-finding approach to problems. According to Benne (29), well-conducted case discussions may, over time, broaden the student's repertoire of diagnostic schemes and he may develop some of the attitudes necessary for dependable and accurate diagnosis—suspension of judgment, acceptance of variety in people and situations, and recognition of the complexities of organizational, group, and individual behavior. In short, the main accomplishment of the Harvard method appears to be the development of a problem-solving orientation, together with a heightened awareness of the factors to be taken into account in approaching problems. Furthermore, by experiencing the testing of his ideas against the opinions of others, a student may learn a greater tolerance for the ambiguities of real-life situations.

From the standpoint of training management, the Harvard method possesses certain advantages. For one thing, instructors do not have to be experts at writing cases. The cases can be prepared by one or more specialists but can be used by many different instructors. Instructors may even be furnished with prepared analyses of the cases, thus ensuring better instructor understanding of the cases and the issues that will probably be raised. Furthermore, because they are printed, the same cases may be studied by many different groups simultaneously, insuring greater uniformity in exposure of students to teaching materials.

Certain limitations are also inherent in the Harvard method. For example, it cannot readily reproduce the unfolding quality of actual events. Realism in the cases is thus reduced. A more critical problem concerns the fact that the material under scrutiny is the behavior of someone else. Accordingly, the student engages in a rather safe, impersonal analysis of a situation in which he is not an actual participant. Diagnosis thus becomes merely an intellectual exercise. The case method does not provide for bringing the behavior of the student to the point of testing it in action and of subsequently analyzing the behavioral consequences both for himself and others. Finally, as with the conference method, the Harvard method makes no provision for learning and practicing action skills.

INCIDENT-PROCESS METHOD

According to Pigors (32, 33), the Harvard case method has serious limitations. For one thing, the typical Harvard case presents most of the available facts in the situation. Pigors contends that, when given all information, the student has no opportunity for developing skill in evaluating problems, in determining what facts are needed, and in digging them out. It is his belief that the Harvard method trains only in problem analysis and not in fact finding.

Pigors also maintains that, since students using the Harvard method never know the real outcome of a case, they miss the benefit of comparing and analyzing the differences between their decisions and those made by experienced leaders. Furthermore, he contends that the nondirective leadership of discussions required in the Harvard method prevents students from getting closure on the problems and that this inhibits learning.

Accordingly, Pigors has developed a modification which he calls the Incident-Process method of case study. In this method, a brief incident requiring adjudication and decision is presented to students. Then, the group must decide what additional information is required. The discussion leader, usually but not necessarily an instructor, is provided with background and factual material which he furnishes only as the members of the group request specific items of information. If the information is not requested, the discussion leader never provides it. Thus, students may finally be required to decide a case on the basis of only partial information because they failed to ferret out everything needed to make a valid decision. After obtaining the desired information, each trainee writes his decision and the supporting reasons for it. The decisions are presented publicly and debated with pressure by the leader toward arriving at a common conclusion. The students then hear the real decision and analyze the adequacy or inadequacy of their fact finding and decision making in contrast with it. Thus, over time and numerous cases, students learn to analyze brief incidents in terms of relevant facts and also to become skillful in obtaining these facts. Pigors believes this process develops the fact-finding ability required to function effectively in the real world.

In this way, Pigors hopes to overcome the limitations he sees in the Harvard method. However, in the Incident-Process method, learning again appears to be restricted to development of diagnostic skills. Although students seem to interact more realistically in trying to reach group decisions, there is no opportunity for studying and trying the actual skills of implementation in situations similar to those studied.

ABBREVIATED CASE

When the Harvard method is strictly followed, lengthy advance preparation by students is inevitable. The requirement for full access to all facts and information in the case usually results in a fairly comprehensive printed document. Accordingly, mastery of the case requires students to engage in extensive preparation for in-class discussions. In some instances, such preparation may be desirable and, certainly, intensive analysis of a complex case should be conducive to learning. However, there may be situations when caliber of students or other demands upon student time may preclude extensive preparation. One means for providing students with full access to necessary information and still avoiding the long preparation required by the Harvard method's extensive documentation is the abbreviated case (34).

The most important advantage of the abbreviated case is its brevity. Reading seldom requires more than 15 minutes. If desired, cases can be assigned at the beginning of each class period, thus assuring that all participants are adequately prepared. Furthermore, since the abbreviated case presents only major points in the reported situation, it becomes easier to keep discussions focused on central issues. This also simplifies the task of discussion leaders.

The principal disadvantage of the abbreviated case is that unimportant facts are eliminated and the minimum of information which appears is presented in such a straightforward manner that students have no opportunity to practice sifting out essential elements from those that are not important. Thus, analysis may become too simple as compared with real situations where an individual may have to weigh and discard a number of secondary factors before arriving at solution of the central problem.

One modification of the abbreviated case which should be mentioned is the dramatized case. In this form, a short case is presented through the medium of either tape recordings (35) or film (36). The cases are usually open-ended, that is, they reach a critical point of conflict and end without resolution of the problem. The group then discusses possible issues and solutions.

The principal advantage of the dramatized case is that it communicates important facts without preliminary reading and with heightened dramatic effect. On the other hand, their effectiveness is usually confined to the presentation of dialogue situations. Thus, the oral form of presentation mainly restricts cases to human relations problems. Cases dealing with non-human aspects such as planning, organization, and technical problems are difficult to portray.

ROLE PLAYING

There is one limitation to the case method which has special significance for leadership or human relations training. Although cases often describe relationships between people, they are not capable of portraying the more dynamic aspects of human interaction or of generating very intensive involvement with the problem situation. Because cases are inadequate to communicate the numerous and varied behavioral cues available to a person who is actually involved in the face-to-face situation, some of the flavor is lost. In an effort to overcome this limitation, many instructors have turned to role playing.

USE IN INSTRUCTION

Role playing is a method of portraying human interaction in imaginary situations in such a manner that realistic behavior is elicited (37, p. 8). This rather general description implies that role playing can be used for many purposes, and, indeed, such is the case. Developed originally as a psychotherapeutic technique, role playing has also been used successfully for problem illustration, problem diagnosis, and training evaluation. Its greatest popularity, however, has been achieved as a method of training, especially in leadership and human relations.

For instructional purposes, a situation is presented to the group and some members are asked to assume roles and to enact the situation toward some resolution. Other students observe the behavior of the actors. The scene may be carried to a resolution or the instructor may stop it at some critical point in the action. Following the scene, observations, as well as thoughts and feelings of the actors, are reported and discussed by the group. In this way, faulty diagnoses, alternative actions, and discrepancies between diagnoses and action can be identified. Alternative ways of handling the situation may be tried by replaying the scene.

Role playing thus provides students with opportunities to observe, experience, and practice actual behavior in contexts somewhat similar to reality. Of particular importance in leadership training is the fact that the full significance of learning is only in a minor way related to elegance of the problem solution, if any. Rather, focus is upon relationships and impacts of the actors upon the situation. Therefore, analysis is concerned with actual behavior rather than concepts.

Emphasis upon experienced behavior is the characteristic that mainly distinguishes role playing from the methods discussed earlier. Because most leadership problems occur when two or more people interact, the basic approach is to create realistic interpersonal situations, use various methods of collecting information about behavior and attitudes in the situations, analyze the information, and endeavor to draw generalizations from the analysis. Generalizations and hypotheses, in turn, are tested in action as students try out new skills. Thus learning is more than verbal. Because the learning grows out of experience, because it deals with the observed behavior of individuals and groups in a public way, role playing is quite different from instructional situations in which behavior is talked about but never examined and in which students never actually experience the problems which are discussed.

RATIONALE

The rationale for role playing starts from the conviction that the problem of training is not solely to transmit facts or viewpoints but to help the student translate knowledge so that it becomes meaningful in his own experience. Therefore, role playing has the fundamental objective of making a student consciously aware of the implications of his actions and of the actions of other people for him, and of helping him to become skillful in diagnosing and acting in ongoing situations. One requirement for the development of this awareness is opportunity for the student to actually experience himself functioning in realistic situations. Role playing provides this opportunity.

The opportunity to experience realistic situations is an essential requirement. However, experience alone never teaches anything. The important factor is whether the student learns from the experience. Such learning can be increased when the opportinity is also provided for consciously testing behavior in action, for getting feedback about its effectiveness, and for analyzing its effects and its consequences. Where provisions are made in the program for students to obtain feedback through group discussion, role playing also fulfills this requirement.

It has already been stated that advocates of role playing consider that the ability to skillfully diagnose ongoing events and their causes is important (37). They contend that this ability can be developed only through observing systematically—merely watching an occurrence is not sufficient. What appears to be required are calculated, purposive observations made under controlled conditions so that the learner is actively and consciously involved in practicing a diagnostic attitude. Role playing provides this opportunity when non-acting members of the group are assigned specific observer functions with instructions to watch for significant events that might occur.

Finally, the rationale for role playing is based on the contention that behavioral skills do not come easily. This implies the need for freedom to make mistakes during the learning process. Accordingly, another requirement is the opportunity to experiment and practice under conditions where mistakes do not have serious consequences. Role playing also provides this opportunity.

A key concept in role playing is "spontaneity" an adequate response to a new situation or a new and adequate response to an old situation (38). Thus, spontaneity is the ability to respond to a variety of changing situations without being constricted by rigid patterns of behavior. With reference to education or training, this suggests that the objective is not to teach the individual some predetermined set of behaviors. Rather, the goal is to develop flexibility so that the student is equipped to cope with new and changing situations *as they occur.*

Degrees of effectiveness and the specific outcomes of role playing vary according to the objectives of the instructor. Three main classes of objectives have been identified. The first involves training students in specific methods and techniques. For example, role playing is extensively used for teaching techniques of conference leading, interviewing, selling, and instructing. In such training, emphasis is mainly upon illustration, drill, practice, and critique. Learning centers around methods and procedures; however, spontaneity remains the keynote.

A second class of objectives is concerned with developing diagnostic and action skills. Although specific problems may be used as the vehicle, the goal is to develop diagnostic sensitivity and action flexibility across a wide spectrum of conditions.

The third class of objectives is concerned with the development of personal insight or self-understanding. Through participation in action situations, the student is able to observe the effects of his behavior on others and of their actions on him. By testing the consequences of his behavior, the student obtains data for evaluating either characteristic or newly acquired ways of handling problems.

ROLE OF INSTRUCTOR

Thus, it can be seen that role playing is an exceptionally flexible method which can be used for a variety of purposes under many different conditions. Numerous modifications can be derived from the basic method, making it possible to explore most kinds of problems and situations. For this reason, the instructor is a critical element in role playing. The way he adapts method to objective, how he structures the role playing scenes, the way role playing is introduced to students, the things he instructs student-observers to look for, and the skill with which he leads discussions, all go to determine the effectiveness of the instruction. The latitude afforded by role playing makes the instructor highly important.

While the instructor is a critical determinant of the effectiveness of role playing, the method does not necessarily require extensive training in its use. Rather, more important requisites are competence as a teacher and precise understanding of the rationale and purposes of the technique as an instructional method. A tolerance for ambiguity and some insight into human behavior is also helpful, but the major requirement is that the instructor know what he is trying to do.

The rationale, purposes, and procedures of role playing can be communicated to novice instructors. Ideally, first-hand experience with role playing and some practice in its use should be a requirement. It is possible, however, to communicate the necessary information through the printed word. Klein, for example, has published an excellent book which describes how spontaneous role playing can be used (39). Maier, Solem, and Maier (31) have written a manual for role playing using industrial problems. The manual presents a rationale, detailed instructions, case materials, and even instructors' guides which point out the important issues in each case and the directions the discussions are likely to take. The trainer is thus furnished with a ready-made course in supervisory relations. Similar manuals could be easily devised for any course, or instructors could be furnished with rationale and instructions together with materials covering a variety of problems and situations to be used as needed.

Emphasis upon spontaneity and the nature of the instructor's role make external control of instruction difficult. While it is easy to obtain uniform presentation of problems across classes, it is virtually impossible to ensure that discussions will be identical. From the viewpoint of spontaneity theory, such uniformity is undesirable for learning. However, regardless of the validity of this view, responsibility for quality and content must rest more with the individual instructor than with training managers.

The fact that role playing is usually limited to portraying close interpersonal behavior is something of a handicap for courses in higher-level leadership where organizational dynamics may be an important topic for study. Some instructors have overcome this problem by designing large role-playing situations so as to enact an entire organization in the process of solving some important problem. Under these conditions, students fill all of the key roles in the organization and remain in role for longer periods, as much as a day or more at a time. Through the use of observers, students receive data relative to their own behavior as well as to the problems occurring between organizational components. Thus, the opportunity is provided for learning about individual, group, and organizational relationships simultaneously.

Another potential limitation is the traditional emphasis in role playing upon behavior. Unless modified, role playing is weak in teaching about other elements such as decision making. Maier, Solem, and Maier (40) have compensated for this limitation by combining case study with role playing so that the most desirable elements of both are available. The student thus has opportunity for learning in both the interpersonal and decision-making aspects of leadership.

COMMITTEE PROBLEM SOLVING

In committee problem solving, real or hypothetical problems are assigned to small groups of students who work together toward a final group product (41). Whereas the case method emphasizes analysis by individual students followed by discussion, committee problem solving stresses discussion and joint effort from the beginning.

The problems assigned may be such that they can be completed within one class session, in which case they are selected so as to parallel or illustrate on-going instruction. On the other hand, problems may require much research and work on them may extend over weeks or even a term or semester. In either event, all facts and information relevant to the problems must be available to the students or accessible through research.

Although solving a problem should certainly help students to learn more about its content, the major learning to come from this method seems to be in the area of problem-solving techniques. Students learn how to attack problems, gather data, weigh alternatives, and derive solutions. Furthermore, in committee problem solving, students learn how to reconcile differing viewpoints in order to arrive at a group decision.

Committee problem solving is especially useful for training groups of people who are required to work together on a daily basis. Thus, staffs, departments, or sections whose missions involve daily cooperative effort may benefit greatly from jointly attacking and solving assigned problems which are not part of the work of the unit.

SUMMATION

The point of this discussion of methods is clear. Although based upon the same underlying rationale, small-group instructional methods differ in terms of objectives, requisite instructors' skills, and expected students' reactions. Accordingly, no one method can be considered a panacea for all needs. All should be included in the instructional armamentarium from which one or a combination of methods can be selected as appropriate under specific conditions.

Chapter 4

RESEARCH WITH SMALL-GROUP METHODS

INTRODUCTION

Despite their widespread use by educators and trainers, systematic research on the effectiveness of small-group methods has not been extensive. Attempts to study the question began as early as 1925 (5) and have continued intermittently since that time. However, no comprehensive programs intended to obtain definitive answers have been undertaken.

Studies of small-group discussion have been approached from many viewpoints, and they have included almost every conceivable variable and combination of variables. As Roseborough points out in her review of experimental studies of small groups (42), research concerned with group discussion has included groups with all types of members, with many different objectives and varying sizes, leaderless groups and groups with appointed leaders, some led permissively and some led directively, groups meeting over differing periods of time, some with opportunity for feedback and self-evaluation, and some with no such opportunities. It is not surprising that results of this research have been termed by Lorge and Brenner as "amorphous" (43).

The lack of programed research can be attributed to many things—the complexity of human behavior, the difficulty of controlling variables, the lack of adequate measures, or the practical problems besetting an instructor whose primary responsibility is the education of students who would also be the subjects of his experiments. However, one factor is even more significant than any of these. This is the difficulty of devising suitable strategies for controlling, describing, and manipulating the phenomena with which the research is concerned. Studies of instructional methods most frequently deal with real-life situations, and the variety of responses available to students makes the complex learning processes that are involved exceedingly difficult to analyze with any degreee of precision. Cause and effect connections are difficult to establish because instructional situations are interpersonal relationships in which many variables are usually functioning simultaneously.

Thus, most studies have been uncoordinated attacks upon isolated aspects of the problem. Despite the rather "amorphous" state of the literature, however, it is possible to obtain answers to a number of questions—such as the following—related to the possible goals of instruction:

(1) Are small-group methods effective for inducing change in people?
(2) Are small-group methods effective for teaching information and concepts?
(3) Are small-group methods more effective for teaching information and concepts than conventional instruction?
(4) Are small-group methods effective and better for training in problem solving?
(5) Are small-group methods effective and better for developing positive attitudes toward the course of instruction?
(6) Are small-group methods effective and better for changing content-specific attitudes?

USE OF SMALL-GROUP METHODS FOR INDUCING CHANGE

Group discussion has been found to be effective in changing a wide range of behavior patterns (42). The best-known of these studies were conducted by Lewin and his associates (44). In general, these studies showed that more housewives changed their attitudes about serving various types of food after participating in a group discussion and decision than after hearing lectures concerning the desirability of serving them. Even more important, however, the changed attitudes carried over into actual behavior. In all the studies, the housewives who participated in the discussion groups actually served the foods much more often than those who heard the lectures. Lewin attributed the permanence of the change to group decision; however, he credited the discussion with inducing the change.

Following the studies by Lewin and his associates, discussion has been used to effect change in a variety of contexts. For example, Roseborough (42) reports that group discussion has been used to change attitudes and prejudices (45, 46, 47), to solve community problems (48, 49), to help alcoholics (50), and to raise industrial productivity (11, 51).

It is significant that, in most of the studies cited, highly skilled, professional leaders guided the discussions and activities were carefully contrived to maximize change. It is also important to note that change did not usually occur within all individuals. Nevertheless, it is clear that, when properly conducted, small-group discussion is effective for inducing change in many people.

SMALL-GROUP METHODS IN INSTRUCTION

Studies of small-group methods in instruction have usually been less rigorous than the research discussed in the previous section. In many instances, the discussion leaders have been less skilled and conditions have not been as well controlled.

A number of the studies have been concerned with training evaluation, mainly in industrial or military programs. Where evaluation has been accomplished, efforts have usually been limited to measurement of the effects of one method or combination of methods against one criterion. Most such studies have been more concerned with demonstrating the utility of a single, uniquely designed program than with comparing the relative merits of several methods or with studying the nature of the learnings achieved.

Evaluation studies have significant value for learning what kinds of programs or methods will produce some results. Furthermore, evaluation provides the instructor responsible for the course with clues for modifying his methods. Nevertheless, however helpful to the particular instructor an evaluation may be, simple evaluation studies produce little knowledge applicable to other instructional contexts and only a few guides for practical decisions relative to them. In short, after evaluation, there is only a little more understanding of general learning implications than there was before. For these reasons, only those evaluation studies which have generalizable relevance will be cited in this chapter.

A number of other studies, performed mainly with college classes, have compared lecture or "instructor-centered" methods with "discussion." In some of these experiments, classes were divided into small groups for the "discussion" condition. However, in others, large classes were not divided and instructors led discussions with groups consisting of, in some cases, up to 50 or 100 students. Only those studies which used small groups (20 or less students) will be cited in this chapter. Furthermore, in no case will studies of *ad hoc* groups be included.

EFFECTIVENESS IN TEACHING INFORMATION AND CONCEPTS

The effectiveness of small-group methods for teaching information and concepts has been the most extensively researched of all the questions listed in the introduction to this chapter. Studies examining this question have been both evaluative and comparative and have included a variety of course contents.

By far the greatest number of studies have compared lectures with some form of "group discussion" in terms of immediate recall of content as measured by achievement tests administered at completion of the course. Content about which students were tested included psychology (52, 53, 54, 55), social relations (56), sociology (57, 58), communicable disease theory (58), and military leadership and human relations (60). In all of these studies, the findings were conclusive. As measured by end-of-course tests, both lecture and discussion methods were effective in teaching information and concepts and no differences were found between the methods.

It is significant that, for each of the above studies, activities of students who participated under "discussion" conditions remained directed toward the acquisition of course content. In contrast, Asch (61) compared lecture with a "non-directive" method in teaching psychology. In the non-directive group, students were free to choose their own goals, select most of their own reading materials, and write weekly reaction reports on their feelings about any experience. Students were expected to provide the discussion and to grade themselves at the end of the term. The role of the instructor was that of a group non-directive counselor who helped create the atmosphere for self-directive learning. He did nothing to direct the group toward learning about any predetermined course content.

On an objective examination dealing with the factual material of the textbook, students who participated under the lecture condition performed significantly better. Asch's findings suggest that, if knowledge of course content is the objective, guidance for student activities is desirable, even if the instructor is limited to leading discussions or merely serves as course director.

The importance of instructor quality is confirmed by Mahoney, Jerdee, and Korman (62), who evaluated an industrial management training program. Second-level managers were exposed to "the principles of management" by case analysis and group discussions conducted by leaders selected from other second-level managers who were eligible for the course and trained for their assignments. Training consisted of participation in an earlier offering of the course and some instruction in the training methods used in it. No significant improvements in knowledge of management principles or in the intensity of case analysis were found. It appears that the ability, training, and experience of instructors is an important factor even when the objective is merely transmittal of course content.

The evidence is clear that small-group discussion can be effective for teaching information and concepts about a variety of academic subjects. This finding is further confirmed for both leadership (60, 63) and supervisory training (64). On the other hand, there is little difference in the value of lecture and discussion for this purpose. Both methods appear to be equally effective.

The findings are somewhat different for the *retention* of information and concepts. Whereas lecture and discussion are equally effective as evaluated by tests administered at completion of the course, information learned through group discussion is better retained as measured by tests administered up to six months after course completion (65, 66, 67).

Although the results are mixed, some evidence suggests that discussion may not be equally effective for all students. For example, with some college courses, it has been found that poorer students learn information and concepts better under more directive methods of instruction, while more able students profit better from discussion (56, 68). On the other hand, in leadership training, DiVesta (60) found that students who started the course at "a low leadership level," as measured by a pre-test, improved more through group discussion while students who started the course at the upper levels of leadership scores were not much affected by either lecture or discussion. This finding is in contrast to a well-known axiom among trainers that "those who need leadership training the most usually profit from it the least."

EFFECTIVENESS IN TEACHING PROBLEM SOLVING

Some valuable insights are provided by several studies of the effects of small-group methods upon the development of skill in solving problems relevant to the content area of a course. These investigations lead to several conclusions that have significant implications for the design and conduct of programs aimed at the development of problem-solving skills.

There is little doubt that small-group methods are effective for improving problem-solving skills of individuals. For example, in experimental (6), classroom (54, 69), and leadership training (63) situations, discussion has resulted in gains in quality of problem solutions. What is more, there is strong support for the idea that discussion is conducive to a higher level of problem solving than is a lecture. Thus, on the basis of his study with a large number of students, Bloom concluded that if evaluation, syntheses, and application are considered as representing relatively active types of thinking which are important for the development of problem-solving abilities and skills, four-fifths of his discussions evoked more thought of this type than did lectures (69).

Although improvement in problem-solving can be obtained even with brief, leaderless "buzz" sessions (28), higher-quality solutions result when discussions are led by a permissive leader (70). Solutions of even better quality are obtained when a leader uses what Maier and Maier call "developmental discussion (71)," which appears to be a variation of the directed conference method.

Probably an even more critical determinant has been discovered by Lawshe, Bolda, and Brune (72), who conducted a series of studies devoted to investigating the effects upon human relations problem solution of single and repeated exposures to the skit-completion method of role playing. Evaluation criteria consisted of gains in problem solution as measured by scaled responses to a standard human relations training case administered before and after training. Postive changes in criterion case responses were found in only those instances where "impact" occurred in connection with the training experience. Furthermore, for those students where the impact factor was evident, the effects of this experience were capable of generalizing to performance on a second criterion case.

Lawshe, Bolda, and Brune define "impact" as a characteristic of a training experience which allows the trainee to criticize own performance in human relations tasks, provides an adequate type of feedback to trainee regarding his performance, and serves to emphasize a particular human relations factor in a strong emotional manner (72). Impact was accomplished by students' role playing of the case materials, and post-performance analyses by the groups such that feedback concerning their performances was available to each student.

This study has important implications. The concept of impact has a sound basis in principles of learning relative to task involvement, feedback, and knowledge of results. Its relevance to the development of problem-solving skills goes far beyond the human relations context in which it was discovered.

Obviously, no sweeping and final conclusions can be drawn from the few studies cited here. However, the findings lend strong support to the idea that small-group techniques are effective in developing problem-solving skills—when properly designed with regard to leadership procedures, course materials, and methodology.

EFFECTIVENESS IN DEVELOPING POSITIVE ATTITUDES TOWARD INSTRUCTION

An important consideration in the design of instructional systems is student motivation. Where learning is the objective, motivation is a principal determinant of achievement. One important factor in such motivation is the extent to which students possess positive attitudes toward the course.

In general, more students who participate under small-group conditions rate their courses higher than those who participate under lecture conditions (53, 54, 58, 61, 73). This finding, however, is not true for all students nor for all situations.

One finding that turns up consistently in studies that compare lecture with group discussion is that, where anxiety exists about course grades, lecture is preferred over discussion (74). It appears that lectures provide more comfort to some students concerning what must be done in order to receive a satisfactory grade, while discussions leave students somewhat in the dark as to what they must know to pass the course (75). This is not to say that such students dislike group discussion but that they like lectures more.

Where course grades were awarded on the basis of objective examinations, students who participated under small-group conditions often reported a greater liking for discussion, and stated they valued lecture more for purposes of helping them to prepare for examinations—despite the fact that such students scored as high on the examinations as those who received lectures (56). It should be emphasized that preference for lectures was not found when grades were not determined by examinations (54, 74).

In general, it can be concluded that small-group methods are effective in developing positive attidues toward courses of instruction. However, in situations where anxiety about course grades is likely, the methods would probably have greater positive effect upon attitudes if some action were taken to help alleviate the anxiety—such as use of essay and problem-solving questions on examinations, provision of student texts to help prepare for examinations, and judicious combination of lectures and discussion.

EFFECTIVENESS IN CHANGING CONTENT-SPECIFIC ATTITUDES

For many instructors, one of the principal goals of instruction is to channel the attitudes of students in directions advocated by the course content (74). Especially in practical courses, student attitudes toward doctrine that is taught, recommended approaches to problems, new techniques, and so forth, may be critical determinanants of whether they ever apply the acquired knowledge and whether they apply it as taught.

One example where attitudes are deemed to be especially important is leadership. Because values and attitudes give direction to interpersonal behavior (76), it is generally accepted that a leader's attitude toward his role, toward his subordinates, and toward human relationships in general are at least as important to effectiveness as his specific skills. For this reason, it is usually deemed desirable for leadership training to change attitudes.

Results of research concerning the effects of small-group methods upon attitudes seem reasonably conclusive. For academic courses, it has been consistently found that discussion is more effective than lecture for changing content-specific attitudes in directions desired by instructors (53, 55, 58). In only one case, the study by Asch (61), discussed previously, was lecture equally effective for changing attitudes. It will be recalled that Asch's "group" condition was a "non-directive" situation in which the instructor served only as counselor to the group and provided no direction for the course. Since students controlled all classroom activities, there is no reason to expect any changes in content-specific attitudes other than those which would normally accrue from routine exposure to any course and which would occur as well from a lecture as from any other instructional method.

Results are also conclusive where instruction was of a more practical nature (77). Thus, in leadership training, small-group methods have been demonstrated consistently to be effective in changing attitudes (64, 72, 78, 79, 80, 81, 82). What is more, the changes appear to be lasting. Hazeltine and Berra (80) rechecked their students one year after their training and found the same changed attitudes as noted upon completion of the course. Carron (78) found changed attitudes still expressed by his students 17 months after completion of training.

It appears that some small-group methods are especially effective in changing attitudes. However, this conclusion does not hold for all methods. For example, Vinacke (28) found that buzz sessions, while effective in developing problem-solving skills, have little influence upon attitudes. The chief characteristic of buzz sessions is their brevity. Accordingly, the finding that they exert little effect upon attitudes would not be unexpected.

SUMMATION

Probably the most striking impression to be gained from a review of research on small-group methods is its scarcity. Except for the few studies reported here, effort among educators and trainers seems to have been devoted more to exploitation of the various methods than to evaluation of their effectiveness.

The complete lack of any substantive research concerned with certain of the methods is also remarkable. In this regard, the most glaring example is the case method, which is one of the most widely used of all small-group techniques in both universities and industrial training. No objective evaluation of the effectiveness of case studies was found.

Despite the scarcity of research and the fact that results were somewhat amorphous, some conclusions can be made. Thus, comparisons of the large-class lecture with small-group methods, principally discussion groups, have shown that lecture and small-group techniques produce about equal results in the acquisition of information and concepts by most students. However, knowledge gained through group methods is better retained. There is a possibility that poorer students may do better when exposed to lectures.

Research indicates that small-group methods are more effective in developing problem-solving skills. Some methods, however, are more effective than others, indicating the necessity for careful course design with regard to leadership procedures, materials, and choice of methodology.

In general, small-group methods are significantly more effective than lectures for changing attitudes. The methods are especially helpful in developing positive attitudes toward course work, thus enhancing motivation for learning. In addition, research indicates that group techniques are more effective in changing content-specific attitudes, which has important implications for application of the knowledge acquired.

These conclusions afford little basis for discarding the lecture as an instructional method. It is of value in attaining all of the objectives discussed in this chapter. As shown here, the lecture is as effective as small-group methods for the transmission of information and concepts. Therefore, because the lecture is capable of accommodating more students in one place in any single period of time, it is probably more efficient than group techniques for disseminating facts. Accordingly, it is reasonable to view the lecture as an important means for providing information in an efficient manner and, in addition, for introducing topics which can be further pursued in depth through small-group methods.

Chapter 5

CONCLUSIONS AND IMPLICATIONS

INTRODUCTION

It has been the purpose of this report to describe the present "state of the art" of small-group methods of instruction. Such an analysis is timely because of current concern with ways of preserving the quality of instruction despite the large numbers of students who must be educated or trained. Small-group methods appear to be one substitute for mass programs of instruction.

Small-group instruction is burgeoning in such widely disparate contexts as colleges, industry, and the Armed Forces. There are probably many reasons for this popularity, not the least of which is a remarkable tendency for fads to play a major role in the choice of educational methods. Nevertheless, one fact remains clear: Small-group methods have been embraced with enthusiasm by large numbers of educators and trainers.

There can be no doubt that small-group methods are founded upon a well-developed rationale which is more elaborate than those for most other teaching methods. With the exception of programed instruction, most methods have evolved through trial and error and, therefore, their rationales are, to say the least, unsystematic. On the other hand, like programed instruction, the rationale for small-group methods has been more or less systematically derived from an already existing body of scientific knowledge. It is the result of a rather sophisticated melding of learning theory with the techniques of group dynamics and, taken as a whole, provides a coherent basis for use of the methods.

Research directly addressed to the question of effectiveness has been neither systematic nor extensive. However, the studies which have been performed demonstrate the efficacy of small-group methods under certain conditions and for specific purposes.

IMPORTANCE OF INSTRUCTIONAL OBJECTIVES

Probably the clearest conclusion to be drawn from this analysis is that, perhaps even more than for other types of education or training, clear and explicit instructional objectives are a critical requisite for the effective use of small-group methods. The methods differ in terms of outcomes, requisite instructors' skills, and expected students' reactions. Accordingly, effective use of the methods requires that instructors know precisely what they are trying to accomplish.

An example involving leadership training will illustrate the importance of clearly-conceived objectives. Both research and experience have confirmed that an important function of a leader is to develop high levels of motivation in subordinates. However, if the exceedingly important issues concerned with the nature of this motivation are ignored, a number of questions important for training design still remain. Is it sufficient for students to be made aware of the fact that other people have motives and needs which must be considered in leadership decisions and actions? In addition, should they be drilled in techniques of "motivating" subordinates? Should they be trained in the ethics of "group-centered leadership"? Should students be taught something about the psychology of motivation? Answers to methodological questions such as these can be determined only when course objectives have been carefully derived.

The implications for course design are crucial. The purpose of education or training is to achieve change. If change is to be achieved, the instructor must be able to control and manipulate his inputs into the course with a high level of precision. Regardless of the kind of instruction undertaken, this is always a knotty problem. The difficulty can be compounded even more if the instructor is unclear regarding precisely what is intended to be accomplished by the course. For example, is the result of instruction to be a cognitive change based on the acquisition of information, an attitudinal change brought about by the additional information and experiences gained through the course, or a behavioral change—an improvement in specified skills? If trainers are not clear relative to the specific changes expected after students are exposed to a course, valid instruction becomes virtually impossible to develop.

Any instructor who is given the responsibility for designing a course finds himself faced squarely with necessity for resolving this problem in some way. As he makes decisions about the proper methods and content to use, he encounters the question of the objectives toward which instruction should be directed. Indeed, as he goes about selecting objectives, he must resolve the deeper problem of his notion of the kinds of behavior the students should exhibit after completion of the course. The instructor's resolution of these problems has important implications for the decisions he must make relative to content, method, and other aspects of instruction.

The principal task of course designers is to devise suitable strategies for eliciting, controlling, and channeling student behavior. The choice of any instructional method is based on a theory about the relation of the method to certain desired behaviors. The instructor has a hypothesis about the kind of behavior he expects to result following a given treatment, and he proceeds to test it—to apply the method and manipulate his inputs in accordance with the theory.

Thus, it is clear that an explicit conception of the behavior which is desired to follow from the course is essential. When an instructor has his objectives clearly in mind and, in addition, has made a careful analysis of the available instructional methods, he is in a more favorable position to design a course with sufficient precision to achieve genuine change.

THE USES OF SMALL-GROUP METHODS

For certain objectives, small-group techniques are the methods of choice; for other purposes, they are valuable options which can provide an educational system with needed flexibility. When used properly, the methods are invaluable for increasing student motivation through greater involvement and participation. Under certain conditions, they even make it possible to ease the loads of overburdened instructors by reducing the time required to prepare formal presentations.

In general, it is feasible to use small-group methods:

(1) To increase depth of understanding and grasp of course content.
(2) To enhance motivation and generate greater involvement of students with the course.
(3) To develop positive attitudes toward later use of material presented in the course.
(4) To develop problem-solving skills specific to the content of the course.
(5) To provide practice in the application of concepts and information to practical problems.

(6) To generate ideas among students concerning ways of applying knowledge acquired in the course.

(7) To develop commitment of students to recommended ways of handling problems.

(8) To emphasize an important issue or drive home a major point of instruction.

(9) When content experts are scarce or not available as instructors.

Despite these benefits, small-group methods are not always used in the best possible ways. One reason may be that their flexibility and relative ease of administration can lead to the belief that the methods are foolproof. Of course, that is not the case. Like all instructional methods, the success of small-group techniques depends largely upon the care with which they are designed and used. For this reason, it is important to state several important cautions with regard to the most effective use of the methods.

First, as discussed in the preceding section, it is essential that methods be selected and used with the instructional objective clearly in mind. Thus, the time, effort, and thought expended in accurate definition of objectives, in selection of proper methods, and in use of the methods appropriate to the objectives will usually be well repaid in the quality of learning that is achieved.

Second, although small-group methods are effective for certain purposes when used alone, they are most successful when students are also equipped with background information concerning the topics or problems under study. The foundation for all small-group methods is discussion, and instructive discussion cannot be accomplished unless students have some informational base from which to talk. This base might derive from experience, from reading, or from formal presentations of information. Therefore, unless most students possess relevant experience, small-group methods are usually more effective when used in conjunction with either printed material or some formal presentation such as lectures or films. In most instances, informational material should precede the use of small-group methods. The only exception is the use of brief leaderless discussion or role playing to introduce a problem or emphasize an issue.

Finally, groups in which members work together over periods of time are, in general, likely to be more efficient and effective vehicles for learning. Therefore, where small-group methods are used repeatedly throughout the duration of a course, it is usually advisable to assign students permanently to groups and allow them to remain together whenever group sessions are considered desirable. An exception is the case where a stated objective is the stimulation of students through exposure to a wide range of ideas and viewpoints. With such an objective, periodic realigning of groups may be advisable.

REQUIREMENTS FOR INSTRUCTORS

It is axiomatic that no instructional method is better than the person who uses it. This statement is especially true with respect to small-group methods of instruction. However, the requirements for effective use of the methods are somewhat different than those for other instructional techniques. For example, it is not essential that discussion leaders or instructors be content experts, although they should have some preparation in the content and expertise would certainly contribute to the quality of learning. Since responsibility for most of the learning rests with the students and since guides for discussion leaders can be prepared by experts, complete mastery of content is not an essential requirement for instructors.

On the other hand, solid grounding in the rationale and uses of small-group methods is necessary for their maximum effectiveness. Thus, it is important for instructors to be well-trained in use of the methods. This includes not only skill in conducting group sessions but familiarity with the purposes of the various methods. Understanding of purposes is necessary because they determine which techniques should be selected and how they should be used.

It is necessary for an instructor to be clear concerning precisely what he is attempting to accomplish in the area of learning, that is, change attitudes, develop skills, and so forth. This is important because the way he manipulates the instructional process will be determined by his understanding of the learning objectives.

Finally, it is important for an instructor to understand, accept, and be comfortable with the premises embodied in the rationale for small-group instruction. Principal among these are the premises that (a) a group of reasonably capable adults can learn on its own if the instructor will let it, (b) it is not essential for an instructor to control every input into a discussion in order for it to be an effective learning experience, and (c) maximum learning probably occurs when a group breaks its dependence upon its instructor and assumes responsibility for learning.

The above requirements for instructors are not difficult to meet. All that is needed is an acceptance of the rationale and some serious study of ways the techniques can and should be applied.

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13. ABSTRACT

The purpose of this report is to evaluate the more common small-group methods in terms of their effectiveness for teaching adults. A rationale for small-group instruction is presented, followed by descriptions of the principal methods, and an evaluation of the techniques based on existing research findings. It is concluded that small-group methods can be effective for enhancing motivation for learning, developing positive attitudes toward later use of course materials, and improving problem-solving skills. But they are no more effective than lectures for transmitting information and concepts, although—when used in conjunction with lectures—the methods are helpful for increasing depth of understanding of course content. Implications for use of small-group methods, including requirements for instructors, are discussed.

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1 COMDT JUDGE ADVOCATE GENERALS SCH U OF VA
1 DPTY COMDT USA AVN SCH ELEMENT GA
1 DPTY ASST COMDT USA AVN SCH ELEMENT GA
1 USA AVN SCH ELEMENT OFC OF DIR OF INSTR ATTN EDUC ADV GA
1 EDUC CONSLT ARMY MILIT POLICE SCH FT GORDON
6 COMDT USA ENGR SCH ATTN EDUC ADV FT BELVOIR
2 COMDT US ARMY SCH EUROPE ATTN REF LIB APO 09172 NY
1 CHF POLICY + TNG LIT DIV ARMY ARMOR SCH FT KNOX
1 COMDT ARMY AVN SCH FT RUCKER ATTN EDUC ADV
1 COMDT ARMY PRIMY HEL SCH FT WOLTERS
1 DIR OF INSTR US MIL ACAD WEST POINT NY
1 DIR OF MILIT INSTR US MILIT ACAD WEST POINT
1 USA INST FOR MIL ASSIST ATTN LIB FT BRAGG
4 USA INST FOR MIL ASSIST ATTN COUNTERINSURGENCY DEPT FT BRAGG
1 ARMY SIG CTR + SCH FT MONMOUTH ATTN TNG LIT DIV OAO
2 COMDT USA MSL & MUN CTR & SCH ATTN CHF OFC OF OPS REDSTONE ARSNL
2 COMDT US WAC SCH US WAC CTR ATTN AJMCT FT MCCLELLAN
2 HQ ABERDEEN PG ATTN TECH LIB
1 COMDT USA INTELL SCH ATTN DIR OF ACADEMIC OPS FT HOLABIRD
1 COMDT USA INTELL SCH ATTN DIR OF DOC & LIT FT HOLABIRD
1 COMDT USA C&GSC OFC OF CHF OF RESIDENT INSTR FT LEAVENWORTH
1 COMDT USA CA SCH ATTN DEPT OF RSCH ANALYSIS & DOC FT GORDON
1 COMDT USA CA SCH ATTN DOI FT GORDON
1 COMDT USA CA SCH ATTN EDUC ADV FT GORDON
1 COMDT USA CA SCH ATTN LIB FT GORDON
1 COMDT USA SCH & TNG CTR ATTN ACOFS G3 TNG DIV FT MCCLELLAN
1 COMDT USA SCH & TNG CTR ATTN ACOFS G3 PLNS & OPS DIV FT MCCLELLAN
10 COMDT USA INST FOR MIL ASSIST ATTN DOI FT BRAGG
1 COMDT USA CBR WPNS ORIENTATION COURSE ATTN DOI DUGWAY UTAH
1 COMDT USA FLD ARTY SCH ATTN DOI FT SILL
1 COMDT USA ARTY & MSL SCH ATTN EDUC SERVICES DIV FT SILL
1 COMDT USA ARTY & MSL SCH ATTN EDUC ADV FT SILL
1 COMDT USA TRANS SCH ATTN DIR OF DOC & LIT FT EUSTIS
1 COMDT USA TRANS SCH ATTN LIB FT EUSTIS
1 USA INST FOR MIL ASST ATTN EDUC ADV FT BRAGG
1 COMDT ARMY QM SCH OFC DIR OF NONRESID ACTVY ATTN TNG MEDIA DIV VA
1 COMDT USA ARTY & MSL SCH ATTN LIB FT SILL
1 CG USA SCH & TNG CTR ATTN ACOFS G3 FT GORDON
1 COMDT USA AD SCH ATTN AKBAAS-DL-EA FT BLISS
2 DIR BRGD + BN OPNS DEPT USAIS FT BENNING
1 DIR COMM ELEC USAIS FT BENNING
1 DIR ABN-AIR MOBILITY DEPT USAIS FT BENNING
1 CG US ARMY SIGNAL CTR & SCH ATTN SIGDTL-3 (COBET II)
1 SECY OF ARMY, PENTAGON
1 DCS-PERS DA ATTN CHF C+S DIV
1 DIR OF PERS STUDIES & RSCH ODCSPER DA WASH DC
2 ACSFOR DA ATTN CHF TNG DIV WASH DC
1 CG USA MAT COMD ATTN AMCRD-TF
1 CHF OF ENGNRS DA ATTN ENGTE-T
1 HQ ARMY MAT COMD R+D DRCTE ATTN AMCRD-RC
1 US ARMY BEHAVIORAL SCI RES LAB WASH, D.C. ATTN: CRD-AR
1 OPO PERS MGT DEV OFC ATTN MOS SEC (NEW EQUIP) OPOMO
1 ARMY PROVOST MARSHAL GEN
1 DIR CIVIL AFFAIRS DRCTE ODCSOPS
1 OFC RESERVE COMPON DA
2 CG USA SEC AGCY ARL HALL STA ATTN AC OF S G1 VA
50 ADMIN DDC ATTN: TCA (HEALY) CAMERON STA ALEX., VA. 22314
1 CO US ARMY MED RES LAB FT KNOX
1 CHF OF R+D DA ATTN CHF TECH + INDSTR LIAISON OFC
2 CG ARMY MED R+D COMD ATTN MEDDH-SR
1 U S ARMY BEHAVIORAL SCI RES LAB WASH, D.C. ATTN CRD-AIC
1 COMDT USA CBT SURVEIL SCH & TNG CTR ATT ED ADV FT HUACHUCA
1 COMDT USA CBT SURVEIL SCH & TNG CTR ATTN ORG DOC & NEW EQUIP ARIZ
2 TNG + DEVEL DIV ODCS-PERS
1 COMDT USA CBT SURVEIL SCH & TNG CTR ATTN 1ST CBT TNG BDE ARIZ
1 CAREER MGT BR ATTN R DETIENNE CAMERON STA ALEX VA
1 PRES ARMY MAINT BD FT KNOX
1 DPTY PRES ARMY MAT COMD BD ABERDEEN PG
15 CG USCONARC ATTN ATIT-RD-RD FT MONROE
2 CG USCONARC ATTN LIB FT MONROE
1 CO ARMY CBT DEVEL COMD MILIT POLICE AGY FT GORDON
1 US ARMY ARCTIC TEST CTR R & D OFFICE SEATTLE
1 CHF USA AD HRU FT BLISS
1 CHF USA ARMOR HRU FT KNOX
1 CHF USA AVN HRU FT RUCKER
1 CHF USA INF HRU FT BENNING
1 CHF USA TNG CTR HRU PRES OF MONTEREY
2 CG 4TH ARMORED DIV ATTN DCSOT APO NY 09326
1 CO 3D ARMORED CAV REGT APO 09034 NY
1 CO 14TH ARMORED CAV REGT APO 09026 NY
2 CG ARMY ARMOR & ARTY FIRING CTR FT STEWART ATTN AC OF S TNG OFCR
10 CO 1ST BN 63RD ARMOR 1ST INF DIV ATTN S3 FT RILEY
1 CO 1ST BN 46TH ARMOR 3RD INF DIV ATTN S3 APO NY 09031
8 CO 2ND BN 68TH ARMOR 8TH INF DIV ATTN S3 APO NY 09034
1 CO COMPANY A 3D BN 32D ARMOR 3D ARMORED DIV APO NY
1 CO 3RD BN 37TH ARMOR 4TH ARMORED DIV ATTN S3 APO NY 09066
2 CO 2ND BN 34TH ARMOR 25TH INF DIV ATTN S3 APO SAN FRAN 96266
1 CALIF NG 40TH ARMORED DIV LOS ANGELES ATTN AC OF SG3
1 59TH COMD HQ DIV ARMY NG JACKSONVILLE FLA
1 CG HQ 27TH ARMORED DIV NY AIR NG SYRACUSE
1 TEXAS NG 49TH ARMORED DIV DALLAS
1 CG ARMY ARMOR CTR FT KNOX ATTN G3 ATBAGT
2 CG 1ST INF DIV ATTN ACOFS G3 APO SAN FRAN 96345
1 CG 3RD INF DIV ATTN ACOFS G3 APO NY 09036
1 CG 4TH INF DIV ATTN ACOFS G3 APO SAN FRAN 96262

1 CG 7TH INF DIV ATT ACOFS G2 APO SAN FRAN 96207
1 CG 8TH INF DIV ATTN ACOFS G2 APO NY 09111
1 CG 5TH INF DIV (MECH) & FT CARSON ATTN ACOFS G2 COLO
3 CG 82ND ABN INF DIV ATTN ACOFS G3 FT BRAGG
1 CO 197TH INF BRGD FT BENNING ATTN S3
1 CO 1ST BN (REINF) ATTN S3 FT MYER
7 CO 3RD BN 6TH INF REGT ATTN S3 APO NY 09742
1 CO 171ST INF BDE ATTN S3 APO SEATTLE 98731
3 CG 25TH INF DIV APO 96225 SAN FRAN
1 CO 2ND BN 15TH INF 3RD INF DIV ATTN S3 APO NY 09026
5 CG 24TH INF DIV ATTN ACOFS G3 FT RILEY
4 CO 1ST BN (MECH) 52ND INF 198TH INF BDE ATTN S3 APO SAN FRAN 96219
2 CO 4TH BN (MECH) 54TH INF ATTN S3 FT KNOX
1 CO USA PARTIC GP USN TNG DEVICE CTR FLA
2 CONSOL RES GP 7TH PSYOP GP APO 96248 SAN FRAN
2 DA OFC OF ASST CHF OF STAFF FOR COMM-ELCT ATTN CETS-6 WASH
1 CG MILIT DIST OF WASHINGTON
1 DIR ARMY LIB PENTAGON
1 STRATEGIC PLANNING GP CORPS OF ENGNR ARMY MAP SERV
1 CHF OF MILIT HIST DA ATTN GEN REF BR
1 CO USA 10TH SPEC FORCES GP FT DEVENS
1 CO 24TH ARTY GP (AD) ATTN S3 RI
1 CG 31ST ARTY BDE AD ATTN S3 PA
1 CO 49TH ARTY GP AD ATTN S3 FT LAWTON
2 HQS 4TH BN 59TH ARTY REGT ATTN S3 NORFOLK
1 CO 28TH ARTY GP AD ATTN S3 SELFRIDGE AFB
1 CO 52ND ARTY BDE AD ATTN S3 FT HANCOCK
1 HQS 45TH ARTY BDE AD ATTN S3 ARL HTS ILL
1 CG 101ST ABN DIV (AIRMOBILE) ATTN ACOFS G3 APO SAN FRAN 96383
1 CG 1ST CAV (AIRMOBILE) ATTN ACOFS G3 APO SAN FRAN 96383
1 US ARMY GEN EQUIP ATTN TECH LIB FT LEE
1 US ARMY TROPIC TEST CTR PO DRAWER 942 ATTN BEHAV SCIEN CZ
8 CG III CORPS & FT HOOD ATTN G3 SEC FT HOOD
30 CO 1ST ARMORED DIV ATTN G3 SEC FT HOOD
30 CG 2D ARMORED DIV ATTN G3 SEC FT HOOD
25 CO 13TH SUPT BGDE ATTN S3 SEC FT HOOD
10 CG USAFAC ATTN G3 SEC FT SILL
20 CO III CORPS ARTY ATTN G3 SEC FT SILL
20 CG USA AD CTR ATTN G3 SEC FT BLISS
3 CG ATTN G3 SEC FT POLK LA
1 BESD ARO OFC CHF OF R&D WASH DC
1 CHF OF R&D DA ATTN SCI INFO BR RSCH SPT DIV WASH DC
2 CINC US PACIFIC FLT FPO 96614 SAN FRAN
1 CINC US ATLANTIC FLT CODE 312A USN BASE NORFOLK
1 CDR TNG COMMAND US PACIFIC FLT SAN DIEGO
5 TECH LIB PERS 11B BUR OF NAV PERS ARL ANNEX
3 DIR PERS RES DIV BUR OF NAV PERS
1 TECH LIB BUR OF SHIPS CODE 210L NAVY DEPT
1 HUMAN FACTORS BR PSYCHOL RES DIV ONR
1 ENGNR PSYCHOL BR ONR CODE 455 ATTN ASST HEAD WASH DC.
3 CO + DIR NAV TNG DEVICE CTR ORLANDO ATTN TECH LIB
1 CO FLT ANTI-AIR WARFARE TNG SAN DIEGO
1 CO NUCLEAR WEAPONS TNG CTR PACIFIC U S NAV AIR STA SAN DIEGO
2 CO FLT TNG CTR NAV BASE NEWPORT
1 CO FLEET TNG CTR U S NAV STA SAN DIEGO
1 CLIN PSYCHOL MENTAL HYGIENE UNIT US NAV ACAD ANNAPOLIS
1 PRES NAV WAR COLL NEWPORT ATTN MAHAN LIB
2 CO + DIR ATLANTIC FLT ANTI-SUB WARFARE TACTICAL SCH NORFOLK
1 CO NUCLEAR WEAPONS TNG CTR ATLANTIC NAV AIR STA NORFOLK
2 CO FLT SONAR SCH KEY WEST
1 CO FLT ANTI-SUB WARFARE SCH SAN DIEGO
1 CHF OF NAV RES ATTN SPEC ASST FOR R & D
1 CHF OF NAV RES ATTN HEAD PERS + TNG BR CODE 458
1 CHF OF NAV RES ATTN HEAD GP PSYCHOL BR CODE 452
1 DIR US NAV RES LAB ATTN CODE 5120
1 DIR NAVAL RSCH ATTN LIB CODE 2029 (ONRL) WASH DC
1 CHF OF NAV AIR TNG TNG RES DEPT NAV AIR STA PENSACOLA
1 CO MED FLD RES LAB CAMP LEJEUNE
1 CDR NAV MSL CTR POINT MUGU CALIF ATTN TECH LIB CODE 3022
1 DIR AEROSPACE CREW EQUIP LAB NAV AIR ENGNR CTR PA
1 OIC NAV PERS RES ACTVY SAN DIEGO
1 NAV NEUROPSYCHIAT RES UNIT SAN DIEGO
2 NAVAL MSL CTR (CODE 5342) PT MUGU CALIF.
1 DIR PERS RES LAB NAV PERS PROGRAM SUPPORT ACTIVITY WASH.NAV YD
1 NAV TNG PERS CTR NAV STA NAV YD ANNEX CODE 83 ATTN LIB WASH
1 COMDT MARINE CORPS HQ MARINE CORPS ATTN CODE AO-1B
1 HQ MARINE CORPS ATTN AX
1 DIR MARINE CORPS EDUC CTR MARINE CORPS SCH QUANTICO
1 DIR MARINE CORPS INST ATTN EVAL UNIT
1 CHF OF NAV OPNS OP-01P1
1 CHF OF NAVL OPS OP 037 WASH DC
1 CHF OF NAV OPNS OP-07T2
2 COMDT HQS 8TH NAV DIST ATTN EDUC ADV NEW ORLEANS
1 CHF OF NAV AIR TECH TNG NAV AIR STA MEMPHIS
1 DIR OPS EVAL GRP OFF OF CHF OF NAV OPS OP03EG
2 COMDT PTP COAST GUARD HQ
1 CHF OFCR PERS RES + REVIEW BR COAST GUARD HQ
1 CO US COAST GUARD TNG CTR GOVERNORS ISLAND NY
1 CO US COAST GUARD TNG CTR CAPE MAY NJ
1 CO US COAST GUARD TNG CTR & SUP CTR ALAMEDA CALIF
1 CO US COAST GUARD INST OKLA CITY OKLA
1 CO US COAST GUARD RES TNG CTR YORKTOWN VA
1 SUPT US COAST GUARD ACAD NEW LONDON CONN
1 OPNS ANLS OFC HQ STRATEGIC AIR COMD OFFUTT AFB
1 AIR TNG COMD RANDOLPH AFB ATTN ATFTM
1 TECH DIR TECH TNG DIV(HRO) AFHRL LOWRY AFB COLO
1 CHF SCI DIV DRCTE SCI + TECH DCS R+D HQ AIR FORCE AFRSTA
1 CHF OF PERS RES BR DRCTE OF CIVILIAN PERS DCS-PERS HQ AIR FORCE
1 CHF ANAL DIV (AFPDPL) DIR OF PERSONNEL PLANNING HQS USAF
1 HQ AFSC SCRB ANDREWS AFB
2 CDR ELEC SYS DIV L G HANSCOM FLD ATTN ESRHA BEDFORD MASS
1 HQ SAMSO (SMSDI) AF UNIT POST OFC LA AFS CALIF
2 MILIT TNG CTR OPC LACKLAND AFB
2 AFHRL (HRT) WRIGHT-PATTERSON AFB
1 AMD [illegible] BROOKS AFB TEXAS

1 HQS ATC DCS/TECH TNG (ATTMS) RANDOLPH AFB
4 HQS ATC (ATCTD-M) RANDOLPH AFB TEXAS
1 CDR ELEC SYS DIV LG HANSCOM FLD ATTN ESTI
1 DIR AIR U LIB MAXWELL AFB ATTN AUL3T-63-253
1 DIR OF LIB US AIR FORCE ACAD
1 COMDT DEF WPNS SYS MGT CTR AF INST OF TECH WRIGHT-PATTERSON AFB
1 COMDT ATTN LIB DEF WPNS SYS MGT CTR AF INST OF TECH WRIGHT-PAT.
1 6570TH PERS RES LAB PRA-4 AEROSPACE MED DIV LACKLAND AFB
1 TECH TNG CTR (LMTC/OP-I-L1) LOWRY AFB
2 AF HUMAN RESOURCES LAB MRHTO WRIGHT-PATTERSON AFB
2 CO HUMAN RESOURCES LAB BROOKS AFB
1 PSYCHOBIOLOGY PROG NATL SCI FOUND
1 DIR NATL SECUR AGY FT GEO G MEADE ATTN TDL
1 DIR NATL SECUR AGY FT GEO G MEADE ATTN DIR OF TNG
5 CIA ATTN OCR/ADD STANDARD DIST
1 SYS EVAL DIV RES DIRECTORATE DOD-OCD PENTAGON
1 DEPT OF STATE BUR OF INTEL + RES EXTERNAL RES STAFF
1 SCI INFO EXCH WASHINGTON
2 CHF MGT & GEN TNG DIV TR 200 FAA WASH DC
1 BUR OF RES & ENGR US POST OFC DEPT ATTN CHF HUMAN FACTORS BR
1 EDUC MEDIA BR OE DEPT OF HEW ATTN T D CLEMENS
1 OFC OF INTERNATL TNG PLANNING & EVAL BR AID WASH DC
1 DEPT OF TRANS FAA ACQ SEC HQ 610A WASH DC
1 SYS DEVEL CORP SANTA MONICA ATTN LIB
2 DUNLAP + ASSOC INC DARIEN ATTN LIB
2 RAC ATTN LIB MCLEAN VA
1 RAND CORP WASHINGTON ATTN LIB
1 DIR RAND CORP SANTA MONICA ATTN LIB
2 U OF SO CALIF ELEC PERS RES GP
1 COLUMBIA U ELEC RES LABS ATTN TECH EDITOR
1 MITRE CORP BEDFORD MASS ATTN LIB
2 SIMULATION ENGR CORP ATTN DIR OF ENGR FAIRFAX VA
2 U OF PGH LEARNING R+D CTR ATTN DIR
1 HUMAN SCI RES INC MCLEAN VA
2 TECH INFO CTR ENGNR DATA SERV N AMER AVN INC COLUMBUS O
1 CHRYSLER CORP MSL DIV DETROIT ATTN TECH INFO CTR
1 RAYTHEON SERV CO ATTN LIBN BURLINGTON MASS
2 EDUC & TNG CONSULTANTS ATTN L C SILVERN LA
1 GEN DYNAMICS POMONA DIV ATTN LIB DIV CALIF
2 MARQUARDT INDSTR PROD CO CUCAMONGA CALIF
1 OTIS ELEVATOR CO DIV ATTN LIB STAMFORD CONN
1 MGR BIOTECHNOLOGY AEROSPACE SYS DIV MS 8H-25 BOEING CO SEATTLE
2 CTR FOR RES IN SOCIAL SYS FLD OFC FT BRAGG
1 IDA RSCH & ENG SUPT DIV ARL VA
1 HUGHES AIRCRAFT COMPANY CULVER CITY CALIF
1 DIR CTR FOR RES ON LEARNING + TEACHING U OF MICH
1 EDITOR TNG RES ABSTR AMER SOC OF TNG DIRS U OF TENN
1 CTR FOR RES IN SOCIAL SYS AMER U
4 BRITISH EMBSY BRITISH DEF RES STAFF WASHINGTON
3 CANADIAN JOINT STAFF OFC OF DEF RES MEMBER WASHINGTON
3 CANADIAN ARMY STAFF WASHINGTON ATTN GSO2 TNG
3 ACS FOR INTEL FOREIGN LIAISON OFCR TO NORWEG MILIT ATTACHE
1 ARMY ATTACHE ROYAL SWEDISH EMBSY WASHINGTON
1 DEF RES MED LAB ONTARIO
3 AUSTRALIAN NAV ATTACHE EMBSY OF AUSTRALIA WASH DC
1 OFC OF AIR ATTACHE AUSTRALIAN EMBSY ATTN: T.A. NAVGN WASH, D.C.
2 AUSTRALIAN EMBSY OFC OF MILIT ATTACHE WASHINGTON
2 U OF SHEFFIELD DEPT OF PSYCHOL
1 MENNINGER FOUNDATION TOPEKA
1 AMER INST FOR RES SILVER SPRING
1 AMER INST FOR RES PGH ATTN LIBN
1 DIR PRIMATE LAB UNIV OF WIS MADISON
3 MATRIX CORP ALEXANDRIA ATTN TECH LIBN
1 AMER TEL+TEL CO NY
1 U OF GEORGIA DEPT OF PSYCHOL
1 DR GEORGE T HAUTY CHMN DEPT OF PSYCHOL U OF DEL
1 VITRO LABS SILVER SPRING MD ATTN LIBN
1 HEAD DEPT OF PSYCHOL UNIV OF SC COLUMBIA
1 TVA ATTN CHF LABOR RELATIONS BR DIV OF PERS KNOXVILLE
1 U OF GEORGIA DEPT OF PSYCHOL
1 GE CO WASH D C
1 AMER INST FOR RES PALO ALTO CALIF
1 MICH STATE U COLL OF SOC SCI
1 N MEX STATE U ATTN PROF OF PSYCHOL
1 ROWLAND + CO HADDONFIELD NJ ATTN PRES
1 OHIO STATE U SCH OF AVN
1 SCI RSCH ASSOC INC DIR OF EVAL CHICAGO ILL
1 AIRCRAFT ARMAMENTS INC COCKEYSVILLE MD
2 OREGON STATE U DEPT OF MILIT SCI ATTN ADJ
1 TUFTS U HUMAN ENGNR INFO + ANLS PROJ
1 AMER PSYCHOL ASSOC WASHINGTON ATTN PSYCHOL ABSTR
1 NO ILL U HEAD DEPT OF PSYCHOL
1 ENGNR LIB FAIRCHILD HILLER REPUBLIC AVN DIV FARMINGDALE N Y
1 WASHINGTON ENGNR SERV CO INC KENSINGTON MD
1 LIFE SCI INC FT WORTH ATTN PRES
1 AMER BEHAV SCI CALIF
1 COLL OF WM + MARY SCH OF EDUC
1 SO ILLINOIS U DEPT OF PSYCHOL
2 COMMUNICABLE DISEASE CTR DEVEL + CONSULTATION SERV SECT ATLANTA
2 WASH MILITARY SYS DIV BETHESDA MD
1 NORTHWESTERN U DEPT OF INDSTR ENGNR
1 HONEYWELL FED SYS MAIL STA [illegible]
1 NY STATE EDUC DEPT ABSTRACT EDITOR AVCR
1 AEROSPACE SAFETY DIV U OF SOUTHERN CALIF LA
1 [illegible] R SMITH RES ASSOC U OF MINN
1 CTR FOR THE ADVANCED STUDY OF EDUC ADMIN U OF OREG
1 DR V ZACHERT [illegible] PARK GA
1 J P LYONS DIR JR ROTC SAN ANTONIO TEXAS
1 DR E [illegible] DEPT OF PSYCH UNIV OF LOUISVILLE
1 DR F [illegible] DEPT OF PSYCH ST CLOUD STATE COLL MINN
1 MR S [illegible] STEPTOE + JOHNSON WASH DC
1 DR W [illegible] VP + PROVOST THE JOHNS HOPKINS UNIV MD
1 DR W C [illegible] U OF SOUTHERN CALIF LA
1 DR C W [illegible]
1 MR J W CHRISTIE PRES RIGGS NATL BANK WASH DC

1 DR G W CLARK VP FOR RSCH RSCH TRIANGLE INST NC
1 GEN H P HARRIS USA RETIPRES THE CITADEL SC
1 DR L T RADER CHMN DEPT OF ELEC ENGNR U OF VA
1 CHF PROCESSING DIV DUKE U LIB
1 U OF CALIF GEN LIB DOCU DEPT
1 FLORIDA STATE U LIB GIFTS + EXCH
1 PSYCHOL LIB HARVARD UNIV CAMBRIDGE
1 U OF ILL LIB SER DEPT
2 U OF KANSAS LIB PERIODICAL DEPT
1 U OF NEBRASKA LIBS ACQ DEPT
1 OHIO STATE U LIBS GIFT + EXCH DIV
1 PENNA STATE U PATTEE LIB DOCU DESK
1 PURDUE U LIBS PERIODICALS CHECKING FILES
1 STANFORD U LIBS DOCU LIB
1 LIBN U OF TEXAS
1 SYRACUSE U LIB SER DIV
1 SERIALS REC UNIV OF MINN MINNEAPOLIS
1 STATE U OF IOWA LIBS SER ACQ
1 NO CAROLINA STATE COLL DH HILL LIB
2 BOSTON U LIBS ACQ DIV
1 U OF MICH LIBS SER DIV
1 BROWN U LIB
2 COLUMBIA U LIBS DOCU ACQ
1 DIR JOINT U LIBS NASHVILLE
2 LIB GEO WASH UNIV ATTN SPEC COLL DEPT WASH DC
2 LIB OF CONGRESS CHF OF EXCH + GIFT DIV
1 U OF PGH DOCU LIBN
1 CATHOLIC U LIB EDUC & PSYCHOL LIB WASH DC
1 U OF KY MARGARET I KING LIB
1 SO ILL U ATTN LIBN SER DEPT
1 KANSAS STATE U FARRELL LIB
1 BRIGHAM YOUNG U LIB SER SECT
1 U OF LOUISVILLE LIB BELKNAP CAMPUS
1 LIB US DEPT OF THE TREAS WASH DC
1 LIB FBI WASH DC
1 ASST PM GEN BUR OF PERS US POD WASH DC
1 LIB US DEPT OF THE INTERIOR WASH DC
1 LIBN NATL AGRIC LIB USDA WASH DC
1 LIB OEO WASH DC
1 LIB US DEPT OF COMMERCE WASH DC
1 LIB US DEPT OF LABOR WASH DC
1 LIB US DEPT OF STATE WASH DC
1 DIR ERIC CLEARINGHOUSE ON ADULT EDUC SYRACUSE UNIV
1 DIR ERIC CLEARINGHOUSE ON EDUC MEDIA & TECHNOL STANFORD UNIV
1 DIR ERIC CLEARINGHOUSE ON HIGHER EDUC GEO WASH UNIV
1 DIR ERIC CLEARINGHOUSE ON JR COLL UCLA
1 DIR ERIC CLEARINGHOUSE ON VOC & TECH EDUC OHIO STATE UNIV
1 ASST DIR FOR JOB CORPS OEO WASH DC
1 DIR FOREIGN SERV INST US DEPT OF STATE ARL VA
1 DIR OF OVERSEAS SCHS US DEPT OF STATE WASH DC
1 DIR OFC OF INTERNATL TNG AID WASH DC
1 DIR STAFF TNG CTR PEACE CORP WASH DC
1 DIR LAW ENFORCEMENT TNG US DEPT OF TREAS WASH DC
1 DIR NATL TNG CTR IRS ARL VA
1 EXEC SEC DEPT OF AUDIOVISUAL INSTR NEA WASH DC
1 EXEC SEC AACTE NEA WASH DC
1 EXEC DIR NTL INST FOR APPLIED BEHAV SCI WASH DC
1 DIR CTR FOR INSTR NEA WASH DC
1 DIR DIV OF EDUC TECHNOL NEA WASH DC
1 DIR RSCH DIV NEA WASH DC
1 EXEC SEC AMER ASSOC OF JR COLL WASH DC
1 PRES AMER COUNCIL ON EDUC WASH DC
1 EXEC SEC ASSOC OF AMER COLL WASH DC
1 DIR OF TNG FBI WASH DC
1 COMM OF INDIAN AFFAIRS US DEPT OF INTERIOR WASH DC
1 DIR OFC OF JOB CORPS COORDINATION US DEPT OF THE INTERIOR WASH DC
1 DIR USDA GRAD SCH WASH DC
1 COMDT US MERCHANT MARINE ACAD KINGS PT NY
1 ADMIN BUR OF APPRENTICESHIP & TNG US DEPT OF LABOR WASH DC
1 ASST MANPOWER ADMIN MANPOWER DEV & TNG US DEPT OF LABOR WASH DC
1 ASST SEC (EDUC) US DEPT OF HEW WASH DC
1 DIR DIV OF MANPOWER & TNG PROGRAMS NIMH CHEVY CHASE MD
1 COMM OF EDUC USOE WASH DC
1 DIR DIV OF VOC & TECH EDUC USOE WASH DC
1 DIR DIV OF EDUC LABS BUR OF RSCH USOE WASH DC
1 DIR DIV OF INFO TECH & DISSEM USOE WASH DC
1 DIR EDUC RESOURCES INFO CTR USOE WASH DC
1 CHF OFC OF PERS USCG ATTN DIR OF TNG WASH DC
1 ASSOC ADMIN PERS & TNG FAA WASH DC
1 DIR DIV OF NUCLEAR EDUC & TNG AEC GERMANTOWN MD
1 DIR OF EDUC PROGRAMS NASA WASH DC
1 ASSOC DIR (EDUC) NSF WASH DC
1 DIR BUR OF TNG US CSC WASH DC
1 DIR TNG & DEV SERV VETERANS ADMIN WASH DC
1 DIR OF TNG AMER NATL RED CROSS WASH DC
1 DIR FED EXT SERV US DEPT OF AGRIC WASH DC
1 COMDT THE COAST GUARD ACAD NEW LONDON CONN
1 DIR APPALACHIA EDUC LAB CHARLESTON W VA
1 DIR CTR FOR URBAN EDUC NY NY
1 DIR CENTRAL MIDWESTERN REGL EDUC LAB ST ANN MO
1 DIR EASTERN REGL INST FOR EDUC SYRACUSE NY
1 DIR EDUC DEVEL CTR INC NEWTON MASS
1 DIR FAR WEST LAB FOR EDUC RSCH & DEV BERKELEY CALIF
1 DIR MID-CONTINENT REGL EDUC LAB KANSAS MO
1 DIR NW REGL EDUC LAB PORTLAND ORE
1 DIR REGL EDUC LAB FOR CAROLINAS & VA DURHAM NC
1 DIR RSCH FOR BETTER SCH INC PHILADELPHIA PA
1 DIR SE EDUC LAB GA
1 DIR SW EDUC DEV LAB AUSTIN TEXAS
1 DIR SW REGL LAB FOR EDUC RED CALIF
1 DIR SW COOP EDUC LAB NM
1 DIR UPPER MIDWEST REGL EDUC LAB MINN